

MODEL AIRPLANE NEWS

10th Year of Publication

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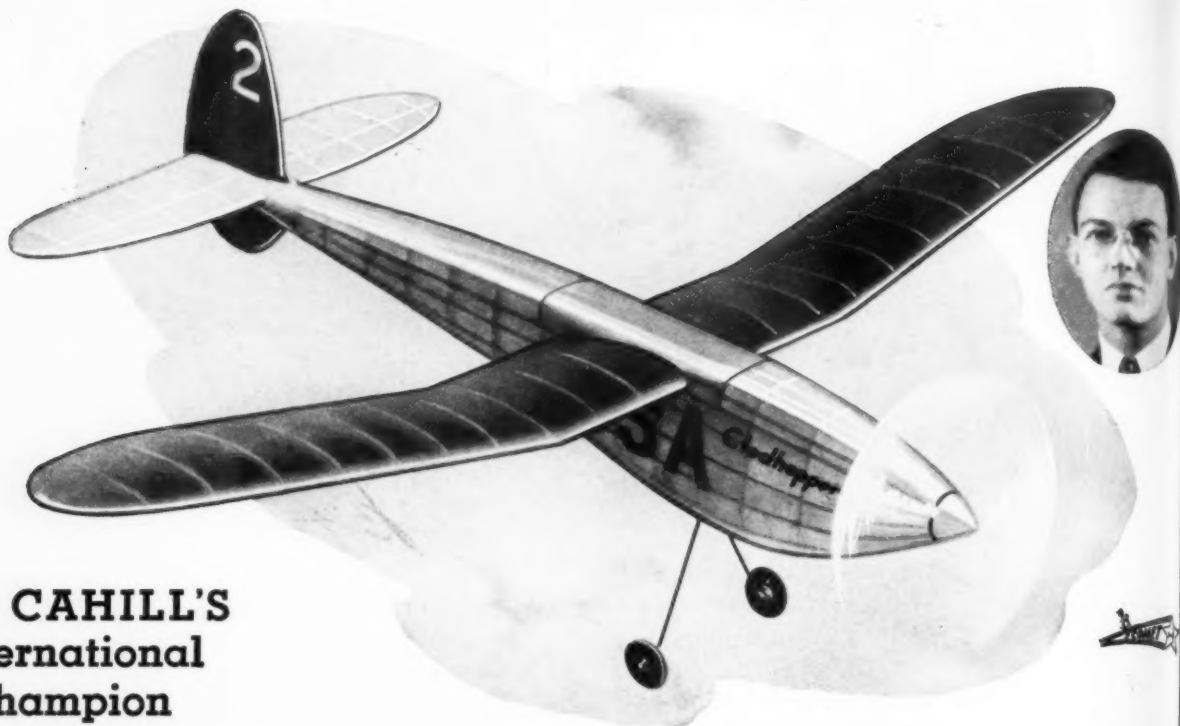
MARCH, 1939

20c

The Fokker D-23
Twin Engine Pursuit Plane

(See Page 9)

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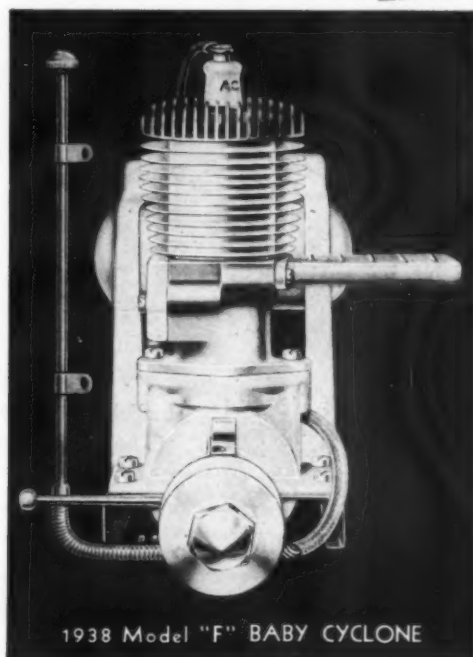
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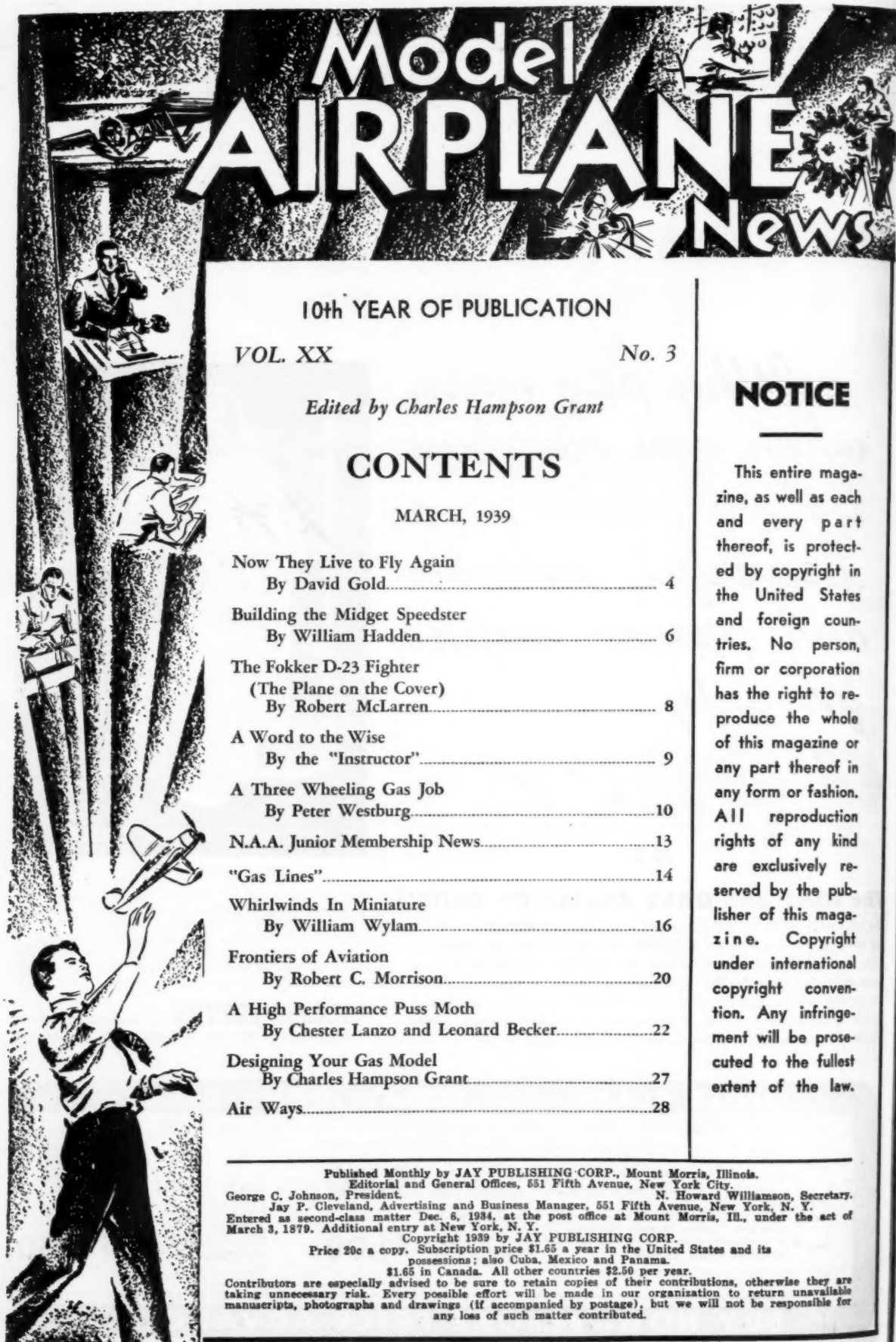
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Model AIRPLANE News

10th YEAR OF PUBLICATION

VOL. XX

No. 3

Edited by Charles Hampson Grant

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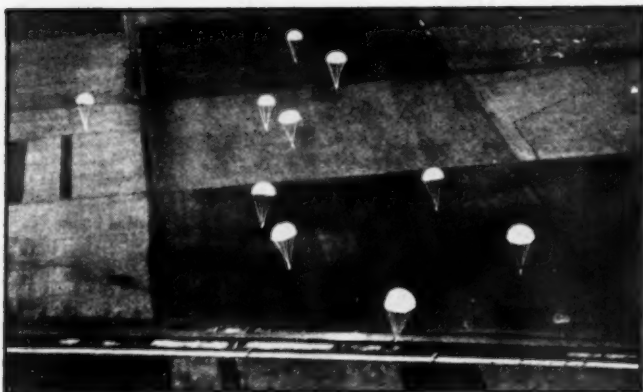
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The U.S. Army airmen land safely in 8 1/5 sec. after jumping from their plane. (Acme)

IF YOU'VE been at a U. S. Army or Navy air base then you've probably seen the matter-of-fact way in which our military airmen don their parachutes prior to going aloft in their fighting ships.

One finds it hard to believe that in the early years of our military air force it was a familiar sight to see fliers refuse parachutes, or when once aloft, to slip out of the harness because they thought the 'chute an unnecessary encumbrance.

This personal prejudice was but one of the many obstacles which the early Air Service Parachute Board had to overcome before establishing their parachute as a necessary part of the military airman's kit.

The closing years of the "Great War" found the Allied and the German Air Forces both becoming more and more conscious of the necessity for a suitable parachute for their fast flying fighters. Had one been on hand, many an intrepid airman would have been spared the horror of falling to his death in a disabled warplane.

As it was, the observers of sausage balloons were saving their lives by the use of parachutes attached to the side of their wicker baskets. Unfortunately, these rather weak contraptions were far from suitable for use in the swift planes.

The German Air Force is given credit with being the first to start the equipping of aviators with these aerial life-savers. It is the general belief that the whole German Air Force was in the process of

being so equipped, after individual aviators, and later individual squadrons, had attempted to supply their own air chutes.

When a few enemy fliers, among them the well-known ace Udet, saved their lives with parachutes, the Allies immediately began the distribution of parachutes, which were similar to balloon 'chutes, to their aviators. Each country had its favorite design, and this fact prompted the American Air Service to develop a suitable design of its own.

The A.E.F. parachute was developed by combining the best features of other existing parachutes. However, the war was over before complete distribution of these 'chutes were executed.

Nevertheless, the American Air Service decided to continue its search for a really suitable parachute for heavier-than-air-craft personnel. All available parachutes at that time were nothing but improved *attached* type parachutes of the balloon type.

The operation of these parachutes depended solely upon the weight of the jumper to unfurl and open the canopy of the parachute. That is; the parachute was pulled out into the line of flight, from its packed condition in the container, by a line which attached it to the plane. The other end of this line was attached to the peak of the parachute. When the parachute was fully extended in the air, being pulled from its container by this attached line, the line would snap at the peak due to the fact that it was rather lightly tacked at this point so as to permit the line to break when the 'chute was fully extended. From

NOW THEY LIVE

How a Tireless Group of Men Developed the Parachute as a Practical Instrument for Saving Lives of Pilots

this free position in the air, the parachute continued to open up and carry its load down.

A Parachute Board was formed at McCook Field, and given the task of developing a parachute that could meet the requirements that flying in the Air Service planes demanded.

On this Board, headed by Major Hoffman (who later designed the Triangle parachute), were Jimmy Russell (perfector of the "Lobe" and Valve para-



The "Back Pack" that permits the wearers to walk around: Used on dirigibles



The pilot landed safely by means of the chute developed by the Parachute Board of the U.S. Army Air Service in 1919-21



A standard Type "S" chute being attached to a bomb rack on a plane prior to drop-testing with a dummy

TO FLY AGAIN

By Dave Gold

Two marooned army men open a pack of provisions dropped to them by parachute from an airplane. (Acme)



chutes), Floyd Smith (originator of the Switlik 'chute), and many other parachute men of note like Higgins, Mumma and Guy Ball.

The task ahead loomed as an unsurmountable point. Theories had to be proven, prejudices had to be overcome and smashed. Thus the Board set to work with little data on hand, and among a not too appreciative surrounding.

Every available type of parachutes was secured from all over the world and

put to severe tests. Worthy features in each design were looked for. However most of these parachutes failed structurally and the attached type proved of little value for airplanes.

This point was proven when Lieut. Caldwell of England fell to his death while demonstrating the English "Guardian Angel" 'chute. When this happened, the Board gave up the development of attached type parachutes for use in planes.

For some time Floyd Smith had been advocating a manually-operated parachute. It was his belief that a parachute should be packed in a container attached to the person by a suitable harness, and so arranged as to be operated manually when the jumper fell clear of the disabled plane. Smith soon designed and successfully dummy drop-tested a pack-on-person parachute of his own design, and submitted it to the Board for its approval. The parachute met with approval, and the Parachute Board decided to develop their parachute along the line suggested by Smith's parachute.

As the successful use of this parachute depended upon a man falling through space, most fliers cast a rather sarcastic eye towards the Board's endeavors. All were sure that a free-falling man would not retain enough of his mental or physical facilities to operate a ripcord by pulling it.

The Board continued to hack away at the problem, firm in its belief of the possibilities of a manually operated parachute, which they considered the proper type of 'chute for airmen in planes. Be-

hind Smith, and the Parachute Board, was Leslie Irvin, who had come to submit a pack parachute of his own design. Although his design was an attached type, Irvin nevertheless became an enthusiastic supporter of the type of parachute the Board was developing.

Irvin, for one, was sure of the feasibility of a man operating a ripcord while plunging through space. At one time in his crowded career of balloonist, parachutist, experimenter and exhibitionist, he had been employed in making dives off of high platforms. Thus he knew from actual experience that the act of falling through the air was in no way detrimental to a person's being.

Finally the Parachute Board's parachute was at a stage where dummy drops had proven its merits, and it remained but for a living man to make the first live jump into the unknown realms of free fall via the Board's parachute; and thus prove or disprove the Board's ideas.

On April 28, 1919, before a large crowd which had gathered to this first live jump, Leslie "Ski-High" Irvin climbed aboard a plane piloted by a somewhat disappointed Floyd Smith. It seems that Smith had hoped to make the first jump himself, but Major Hoffman insisted that Irvin was more suited to the task.

Before the crowd that had come to see him killed, Irvin bailed out. The jump was a disappointment to the morbid crowd, a success for the Board, but a painful and joyful experience for Irvin.

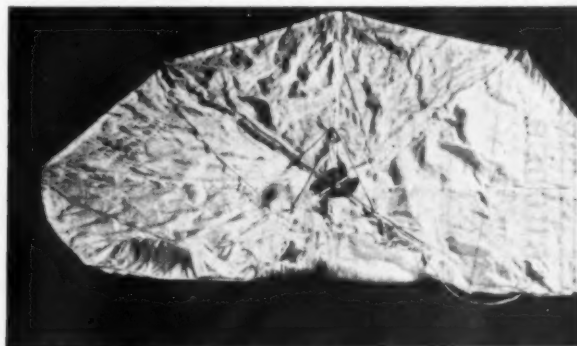
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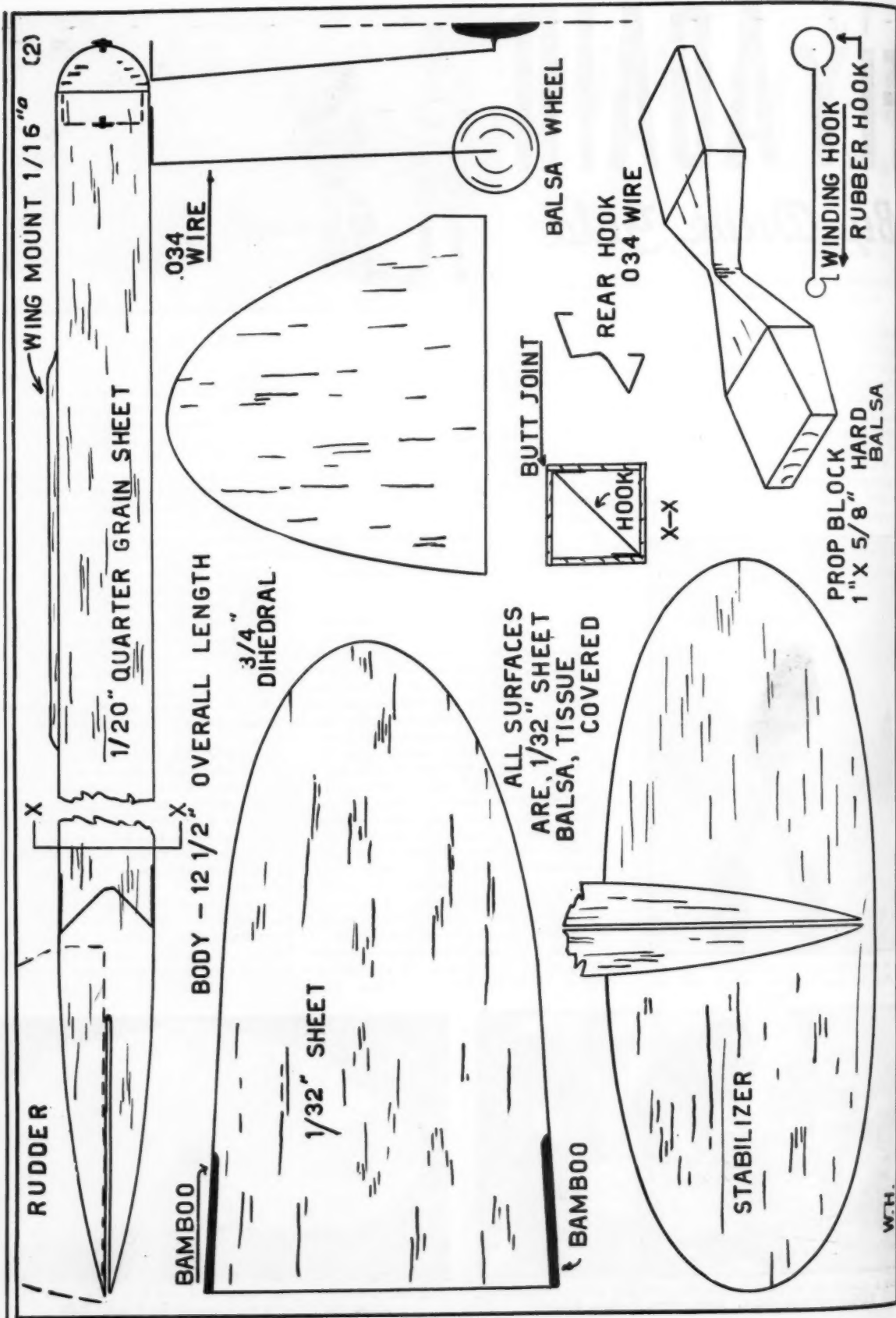
At the moment of landing the harness must be comfortable, strong and adjustable



A group of supposedly starving soldiers receive a crate of EGGS via parachute. None were broken. (Acme)



A 3 foot pilot chute that opens first and drags the main parachute out into the airstream as the aviator falls



BUILDING THE MIDGET SPEEDSTER

A Little Speed Demon That Is Easy
to Build and Which Will Clip Time
From Any Record

SPEED model building and flying is one of the most neglected phases of model aviation. Present day records of over sixty m.p.h. were equaled a decade ago. Endurance and gas models have been continually progressing to the present standard, leaving speed models in a rut.

Why? Certainly speed models draw the crowds and provide thrills aplenty.

This model is presented to arouse the enthusiasm of the most apathetic builder toward this phase of the hobby.

Potentially this model does not command enough speed to break records; this is due to its small size. Nevertheless it can zipp along with the zippiest of them without boring itself into anything but that straight channel of air to the finish line.

For the strongest and lightest construction, use soft quarter-grain balsa throughout. Plans are given in full size so no difficulty should be experienced in the construction.

List of Material Needed

One sheet of 1/20" soft balsa for the body.

One sheet of 1/32" soft balsa for the wing and tail.

A length of .034 wire, rubber, tissue, washers and eyelets.

Hard block of balsa 1" x 5/8" for the propeller.

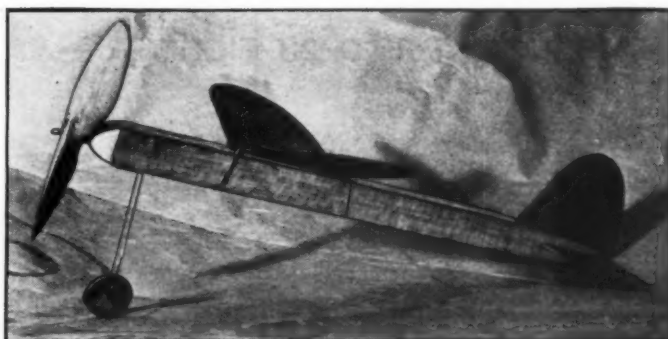
Body

Four sheets of light quarter-grained balsa are cut together to the same shape shown on the plans. The finished body is a square tube tapering towards one end and open at the other to receive the nose plug. This is accomplished by butt-jointing the four corners. This type of construction eliminates all longerons and still retains amazing strength. Use pins to hold joints while the cement dries. When your construction has progressed to where three sides form a "U" tube, the rear hook can be put in. The shape is shown on the plans. It is cemented diagonally to two corners with a thick coat of glue. While drying, the fourth

side can be attached. Next, round off the corners and sand the sides.

The one-legged landing gear is made of .034 wire extending in two struts to a common axle. The one wheel is made of balsa and may be paper covered. Glue the struts securely to the body.

To finish the body, slots now must be cut in the rear. These are 1/32" wide and hold the stabilizer and rudder. Take great care in cutting these as it can readily be seen that the surfaces must be parallel to the thrust line or line of flight. Two parallel strips of balsa 1/16" square each are finally cemented to the top of the body, at the indicated position, to mount the wing. To beautify the body,



The completed model is simple, light and fast

By WILLIAM HADDEN

The wing halves are glued together, covered with tissue, and doped two or three times. This gives the wood a newborn strength. A check-up should frequently be made to discover any new warp which is bound to happen due to the unequal drying of the dope.

The above procedure is also followed in the making of the tail surfaces.

Propeller and Nose

Medium pitch seems to be the best for speed flying. The blank is cut from very hard balsa. Size 1" x 5/8". The cut-away portion of the center extends half the way to the tips. Carving is done in the usual manner, using a sharp knife. About 1/16" under-camber in the blades is perfect.

The prop shaft has a closed winding hook, to facilitate winding.

Medium grade balsa is used for the nose block. The plug is cut from 1/4" sheet and should fit tightly, but not until it is first attached to the nose block!

Bearings are made by inserting small bushings into large washers. The way to determine neutral thrust is to push a long straight piece, of wire through the center of the nose, and while pushing it slowly through to the plug, correct any deviation you may notice. This, if done correctly, will result in a neutral thrust prop shaft.

Dope the propeller several times, sanding in between each coat. Sixteen strands of 3/32"

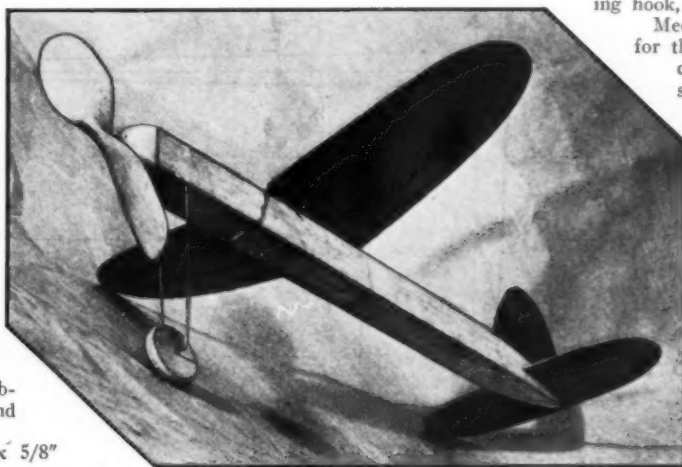
flat rubber dropped around the rear hook with the aid of a weighted string completes the model.

Flying

One good thing about speed model flying is that calm weather is not so important as in other types of flying.

Pick a place where there is plenty of soft terra firma or tall grass (weeds). Check the wing and see that it has no incidence and that the C. G. is under the center of the wing. Launch the model straight into the air, but parallel to the

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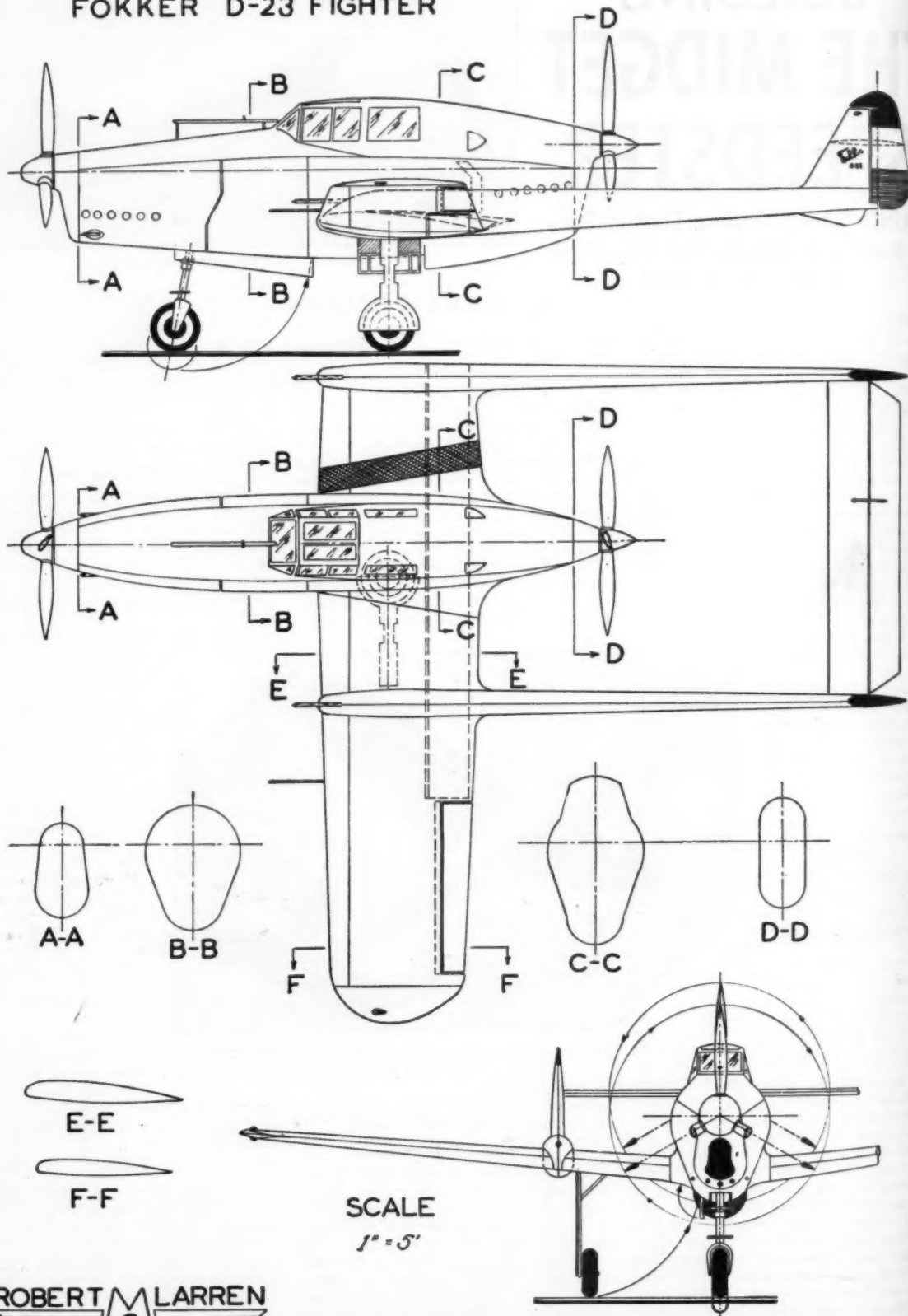
Just the plane to use on experimental speed flights. Note the one-wheel landing gear

strips of colored tissue can be mounted. This is left to the builder's fancy.

Wing and Tail Surfaces

As can be seen, the wing and tail surfaces are very simply constructed. However, careful work always pays; so do a good job in sanding the wood to a symmetrical shape free from warp. The wing must be fastened firmly to the body, so a good insurance against the rubber-band eating into the wing is to have bamboo guards built into the leading and trailing edge of the wing as shown on the plans.

FOKKER D-23 FIGHTER



ROBERT M. LARREN

SCALE
1" = 5'

THE FOKKER D-23 FIGHTER

A New Style of Pursuit Craft with Astounding Performance.
Will It Revolutionize the Design of This Type of Plane?

THE PLANE ON THE COVER

By ROBERT McLARREN

TWO decades ago a long, snake-like caravan of rumbling box cars rolled slowly across the low green fields of Holland. Its entourage consisted of a mixed crew of Germans and Dutchmen, cousins under the skin but one a warrior the other a neutral in the holocaust which had ended just two months before: on November the eleventh. The intriguing fact of this picture was that in that train of box cars were approximately seventy-five Fokker D-7 and D-8 fighters!

Here's the picture: Germany was defeated, broken, her nation infested with revolutionists, the Mark worthless and Allied Guards of the Army of Occupation stationed at every strategic point watching, always watching! The Treaty of Versailles had said: "In erster Linie alle Apparate D.VII" which, to you and me, meant: "Especially all machines of the D-7 type." All undelivered war machines of Fokker Flugzeugwerke at Schwerin were to be delivered to flying fields designated for the cremation ceremony. Yet here was a train load of just such planes traveling serenely

along in Holland, safe from destruction!

When Anthony H. G. Fokker first received word of the scheduled destruction of his latest models, the culmination of five years of day and night work, he sent truckloads of them into the countryside and hid them in cellars, barns and attics of his friends among the countryfolk. And when the word came that all was ready for the big smuggling plot trucks scurried across the hills and fields gathering up the hidden war supplies not unlike a modern "calling all cars" police episode.

The train was made up of sixty cars. Since the sidings at the frontier would only accommodate forty cars, this entire train would have to be run completely through to Holland to keep the line clear. Trainmasters along the entire route had been seen and "talked to" and well over one hundred station-masters, German and Dutch custom officials and railroad hands jingled pockets laden with Anthony Fokker's gold. Just before the transport rolled into Saltzbergen, the border German town, a report was flashed to the Allied and German patrols that a large smuggling attempt

was being made at a railroad station a short way down the border. This attempt was made as a blind and the bait was actually sacrificed to throw the patrol off the scent. With the coast clear the caravan moved into Dutch territory and was soon in Amsterdam.

This was but the first of six such trains to traverse the death-laden miles between Schwerin and Amsterdam. Altogether these 350 cars brought out of Germany over four hundred engines, one hundred and twenty D-7's in a complete or nearly complete state, at least sixty of the two-seater observation planes which had never been released for the Front, twenty-five D-8's (Flying Razors), to say nothing of carloads of brass and steel fittings, rubber tubing, aluminum plates, screws, propellers, upholstery materials and the thousand-and-one other items of supply which are necessary in airplane construction. Everything removable at Schwerin, which was valuable enough to transport, was tossed on board in great disarray in the rush.

Against all obstacles and contrary to every expectation the contents of an entire factory, one of the largest airplane

(Continued on page 46)

By The "Instructor"

A WORD TO THE WISE

THIS month's quiz for the club-minded aeromodeler: Do we want girls in OUR group? Which is better, officers or a board of directors?

GATHER round, friends, while we dish out the dots on this 'n' that: Comes a time in the lives of lots of builders when they figure they're missing something by not belonging to a model airplane club—there being no such group in the vicinity. . . . What's to do about it? . . . ORGANIZE YOUR OWN. Listen to this: We assume you know something about models; you've been building them for a couple of years? Swell, then enlist the aid of a couple of model-plane pals and first try your school . . . what does teacher think? She says it sounds good, why not see the principal? . . . (Gee, this is going to be involved!) . . . Secret: whenever you see these folks, tote along several different types of models—good looking ones—if possible, including a sleek gas job . . . and show a little enthusiasm, too . . . if you don't no one else will!

So after school you drop in and see the principal . . . he's interested, wants to know more about the hobby . . . how many fellows build models? . . . You don't say; incredible! . . . Well, what do you want to do, chum? . . . oh, organize a club, hey? Now's the time to ask him if announcements could be made in nearby schools or a notice posted on the bulletin boards . . . oh, yes, and how about a mention in the

school paper—keep it out of the gossip columns or home-room notes—this is something important!

Simple, heh? But supposin' you don't want a school club. Independent, that's you and your friends. O. K., this is a free country, you know . . . but what are you going to do for a sponsor, advertise? . . . That's not a bad idea . . . advertise the fact you're forming a model club and are desirous of a sponsor and members. . . . One way: Barge in and see the secretary of the chamber of commerce . . . probably he won't want to sponsor your club or anyone else's, but he may have some excellent suggestions . . . for he's the guy who knows everybody. If the secretary is on vacation don't mope around for two weeks—try the local representative of the National Youth Administration, the hobby director at the Y.M.C.A., or your uncle's business partner who's a scoutmaster.

We're assuming in all this that your city is a modest-sized one . . . from 10,000 to 20,000 in population. If it's larger—then you've all the more prospects; if it's smaller—you already know plenty of people and that'll be a great aid.

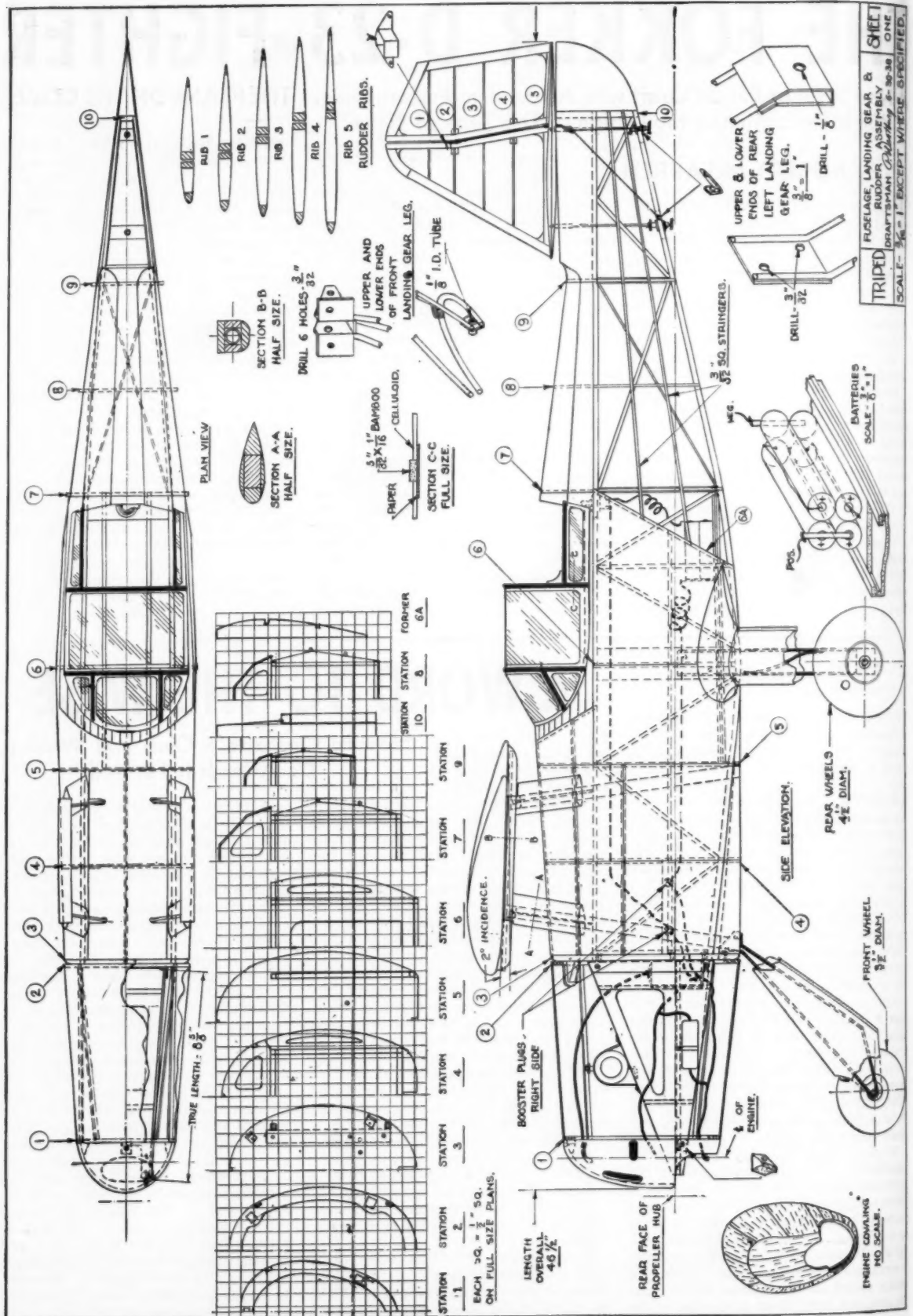
Everyone will ask "How many chaps build models around here?" . . . don't look vague or guess at "an awful lot!" Make up a list of the ones you know or have

How to Organize a Club and What to Do After It Is Formed

heard of, ask your local model supply dealer for a list—he would welcome the formation of a club, for an active one will increase his business . . . and while you're talking with him ask permission to post a notice in his shop telling of the proposed group . . . then work out an announcement with plenty of zip and several good sketches or photographs of models . . . remember that a picture is better'n a thousand words!

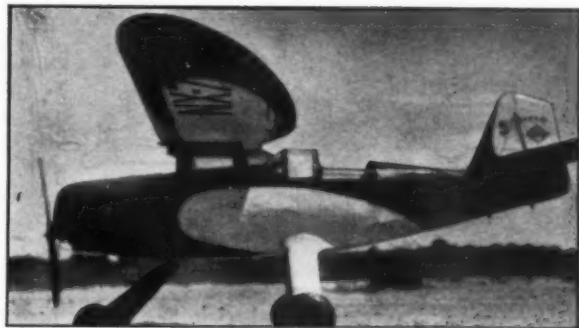
Next stop might be some of the larger stores where you'd see the head of the promotion division . . . and even if he doesn't want a model club dropped in his lap, he might be able to suggest some good leads . . . talk with the feature writer on the local paper; if he's alert he'll welcome your offer to write a brief article on the soon-to-be-established club as well as local and national model-plane activities . . . maybe you'll need some help in writing the story . . . so what? . . . it'll be changed anyhow. . . . Of course, you and your pals have contacted someone by now who'll be "angel" to your club . . . but don't neglect the city's radio station . . . think of the fun the sound effects man can have with a fast-revving gas motor on a model airplane program. . . . In all this activity: Remember to consult your parents—they'll have some

(Continued on page 50)





The nose wheel protects the propeller in bad landings



A pursuit type with fine flying qualities

A THREE WHEELING GAS MODEL

Complete Data From Which You Can Build An Up To Date Gas Model That Gives Thrilling Performance

By PETER W. WESTBURG

THIS gas model was designed primarily as an experiment to test the adaptability of a tricycle landing gear to a gas model. Except for this innovation, the model is quite orthodox in construction and closely follows the methods which we have so far successfully used in previous models.

You will experience a new thrill watching the landings of this model. In the conventional model, too steep a glide very often leads to a very badly damaged nose or engine and usually a broken propeller. In this three-wheeler, the front landing gear wheel protects the propeller, engine and nose of the plane and as a result there is very little or no damage to the plane in landing.

If the rear landing gear legs are moved from 1-1/2 inches to 2 inches farther forward than is shown in the plans, you will get better and quicker take-offs. This is a matter of choice. If you decide to move the landing gear legs forward, a few minor changes will be necessary in the size and location of Bulkhead No. 6 and the uprights, diagonals and crosspieces adjacent to it.

Originally powered by a Baby Cyclone, the model performed well enough, but later a Brown Jr. was installed which considerably increased the performance. With the Brown Jr. we had better takeoffs and a higher rate of climb.

While this model has a rather high wing loading, it is a very stable flyer and also quite fast.

In making this model, follow the plans closely and do not deviate unnecessarily from them. Pay especial attention to the construction and alignment of the cabane struts and the front wheel.

Since the fin and rudder is the easiest single unit to make, we will begin construction with them. The leading edge of the fin is 3/8" by 1/4". Make the triangle consisting of the leading edge, the rudder post, and bottom rib (5) and insert all the other ribs which are of 1/16" thick balsa. Both rudder posts are 3/8" by 1/4" balsa and are broken at the point where rib (2) intersects them. Make the rudder in

the same way and cut the slots for the 1/8" by 1" brass strip hinges which are glued to the rudder ribs (2) and (4).

The tin fitting is cut from a blank 1/4" by 1-3/8" and two small holes are drilled in the tips for the tail wires which are of No. 24 tinned wire.

If you care to, glue small triangular blocks in each corner of the fin and rudder and sand to a curve as shown. These eliminate wrinkles when covering, but are not absolutely necessary.

Make the upper fitting for the stabilizer adjustment mechanism first. It is simply a (T) made by soldering a stem of 1/8" O.D. brass tubing 5/8" long to a bar of tubing which is 7/8" long. The stem is drilled with a No. 50 drill, then tapped with

sides of the leading edges for the 1/4" by 1/16" strips which form the main ribs. Cement these on and, when dry, put on the trailing edge and tips. At this point, put in the front piece with the fitting bound to it and the center piece of the trailing edge. Ribs (6) are next put in, the top and bottom surfaces between these ribs being covered with 1/32" balsa. The bottom surfaces must have two rectangular holes cut out for the fittings. The inner braces are 3/32" square. Go over all the joints with glue and, when dry, trim off the edges. Put on the tail wire fittings, which are like the tail wire fitting on the rudder, and wire well.

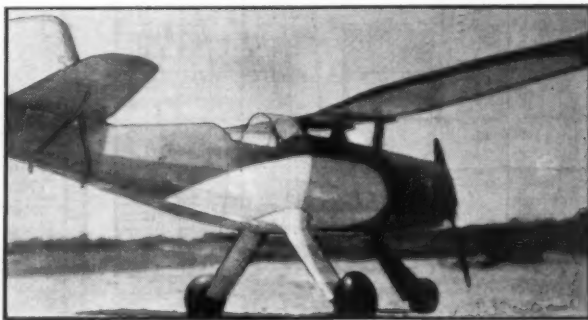
The wing in construction and shape very closely resembles the pursuit type gas model wing which proved so effective and which some of you have perhaps made. It can be made in two panels as shown in the plans, or as a straight wing. The former method is the better since it allows easier handling and there is less possibility of the wing breaking in a bad landing. If you choose the latter method, you will probably have to splice your spars. Only one center rib is necessary then and it can be made of 1/16" balsa.

Ribs (14) to (24) inclusive are all of the familiar Clark Y wing section which we firmly believe to be the best for gas models. The table of ordinates is given at the end of the article.

Ribs (12), (13), and (25) to (30) inclusive have all been presented on the graph and are very similar to the others. Butt rib (30) is 3/16" thick and rib (28) is 1/4" thick; all others are 1/16" thick. Make all the

ribs first; and after binding to the spars the 1/4" O.D. aluminum tubing which receives the lateral shear pins, assemble all but rib (28) on the spars. The front spar is 1/2" thick and varies in height from 1-1/16" to 5/16". The rear spar is also 1/2" thick and varies in height from 3/4" to 1/8", where it joins the trailing edge. It is broken where rib (24) intersects it and in cross section is trapezoidal to conform with the curve of the ribs. When

(Continued on page 34)

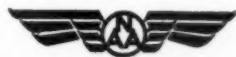


The parasol wing is adjustable

a 2-56 N.C.-3 tap. The bar is drilled 3/32" to receive a 3/32" rod. The whole is bound and cemented to the spar. A shallow notch is cut out of the spar to allow free movement. A similar fitting is made for the front shaft and is bound and glued to the front piece which forms part of the leading edge of the stabilizer.

Assemble ribs (7), (8), (9), (10) and (11) on the spar which is 1/4" square and glue on the leading edges. Remember to cut out notches on upper and lower

National Aeronautic Association Junior Membership News



Prepared by National Aeronautic Association, Dupont Circle, Washington, D. C.

Wakefield International Cup Contest

FOR THE fifth time out of the eleven years that the Wakefield Contest has been held, the Wakefield Cup was won by an American. James Cahill of Indianapolis, won the International Contest, which last year was held at Guyancourt, France; thereby bringing the famous Wakefield International Cup and the Contest to the United States for 1939.

The Greater New York Chapter of the National Aeronautic Association in cooperation with the New York World's Fair, has undertaken the sponsorship in this year's Wakefield International contest and promises to make this year's event in keeping with the magnificence of the New York World's Fair.

An invitation is hereby extended to all nations to send their teams to compete in the International Contest. Those fortunate enough to place in their National Elimination Contest and win a place on their country's Wakefield team, will be feted as they never have been before in their lives. A gala program of entertainment and sight seeing has been arranged for the visiting teams. A cash prize of \$250.00 will be awarded the winning team.

Irwin S. Polk has been named Wakefield International Cup Contest manager. Model aeronautic officials of all nations are invited to declare their intent to participate by writing to Mr. Polk at 429 7 St., New York. It is hoped that many nations will send teams or their winning models to be flown by proxy.

The Academy of Model Aeronautics semi-annual conference was held in New York City November 26th and 27th. The new officers are: Edward Roberts, President; Carl Goldberg, Vice-President; and Irwin S. Polk, Secretary-Treasurer.

The Academy planned to strengthen its own organization by appointing in each state a State Director, and where activities required it, one or more assistant directors. This plan would provide a suitable man in each state who could make proper recommendations to the Academy or the National Aeronautic Association, upon which action by either organization may be based. This set-up parallels the National Aeronautic Association Senior Division plan and would tie up very closely with each state aviation commission, and would allow closer cooperation within the Senior National Aeronautic Association, aviation groups and the model activity. Selection of these State Directors would depend on their activities in model work, interest, ability, etc. and the

DON'T FORGET Renew Your Gas Model License

NOW that the first anniversary of the N.A.A. Gas Model Division has rolled around, let us remind you to glance at the date on your N.A.A. Gas Model License. As you should know, membership in the Gas Model Division runs for one year, with an initial and renewal fee of \$1.00. You will keep the same numbers that you have held during the past year, but it should be emphasized that when you send in your dollar, you should mention the fact that you are renewing in order to avoid confusion.

If a member allows his license to expire, it is possible that he will discover too late that it has been put back in circulation when he makes application for renewal, so get your renewal in to headquarters a couple of weeks early. It will help you avoid trouble.

choice of the residents in the state concerned. In order to start things moving the Executive Board has issued a call for names of suggested State Directors. Appointment will be made for a trial period from the names submitted by the builders in each state as well as the Executive Board. After the system gets under way, re-appointments or continuance of these State Directors will be determined by the model builders themselves.

The National model rules were studied, and recommendations were made for changes which upon their approval by the National Aeronautic Association Contest Board will be released.

A resolution was passed to accept the proposal for gas model airplane insurance. The Academy urges that all model builders apply for this insurance immediately so that the insurance can go into effect as soon as possible or at least in time for spring and summer flying.

The time of the motor run for power models was reduced to 20 seconds for competition flying. For sport flying, the 30 second rule remains in effect. The eight ounces per square foot wing loading rule and limitation per weight of model of seven pounds remains the same.

A power model committee consisting of Elbert Whethers, Irwin Ohlsson, Barney Snyder, William Atwood, Michael Roll, J.

R. Forster, Alan D. Booton, Bob Summers, Mrs. Papoon, Bob Allen, Charles Grant, was appointed. Maxwell Bassett was appointed chairman of the power model committee. This committee will study the power model rules proposed at the Academy meeting after which time a ballot will be issued to all the Academy members, for their final approval before submitting the results to the National Aeronautic Contest Board. The Academy recommends that essentially the same rules and events as were held last year be held again at this year's National Contest. Should sponsorship be forthcoming, it was recommended that an exhibition scale model event also be conducted.

Individuals whose active interest, desire to foster model aviation, outstanding performance and recognized leadership in model aeronautics, qualifies them for membership in the Academy of Model Aeronautics are invited to write to the Academy Secretary for applications.

The Academy accepted the invitation from David Click, president of the Greater New York Chapter of the N.A.A. to conduct the Wakefield International Cup Contest in New York in conjunction with the N. Y. World's Fair. In order to enable the winners of the elimination Contest to prepare for the International Meet, the International Contest was scheduled to be held in the early part of August.

Twelfth National Championship Model Airplane Meet

The 1939 National Airplane Championship Model Airplane Contest will be held in Detroit, July 5th to the 9th. This year's National Meet promises to surpass in magnificence even last year's meet, which was acclaimed the best ever held.

The contest will be sponsored by the Exchange Club Council of Detroit, which consists of 28 Exchange Clubs in the greater Detroit area.

Arthur J. Vhay, Operations Officer of last year's meet, has been named as the General Director of the 1939 Nationals. Irwin S. Polk retains his job as Meet Manager.

Like last year, an insignia competition is planned. Those artistically inclined are asked to give some thought to an insignia which would symbolize youth in aviation through model building, support and cooperation by the Exchange Clubs and guidance and supervision by the National Aeronautic Association. H. A. Thomas, of

(Continued on page 57)

JOIN THE NATIONAL AERONAUTIC ASSOCIATION!
SEND FOR APPLICATION BLANK TO N.A.A., DUPONT CIRCLE, WASHINGTON, D.C.



Pict. No. 1. Charles Eilerman's Stinson taking the air. Not a real ship, just a model

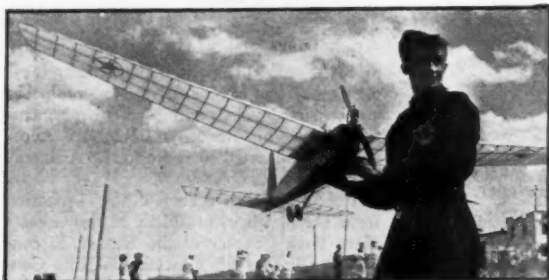
GAS LINES

Official Section of the National Aeronautic Association Gas Model Division

National Rules That Will Please Everyone



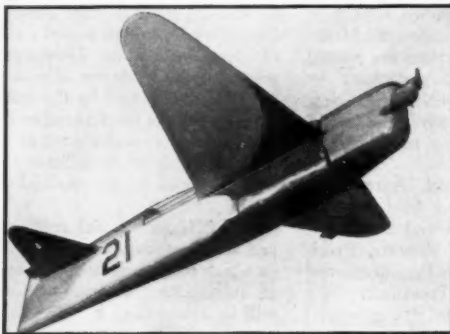
Pict. No. 4. W. B. Mackley's ship "way down" in New Zealand



Pict. No. 5. This shows what the Russians are building



Pict. No. 6. The smallest operable gas engine in the world



Pict. No. 7. Lowell Johnson's racing gas model



Pict. No. 8. Three camera models all alike, designed by Elbert Weathers



Pict. No. 9. A plane going the wrong way

MODEL leaders throughout the country are slowly but surely becoming convinced that, the simpler and more fundamental gas model rules are, the more they will serve the best interest of all model builders on a national scale.

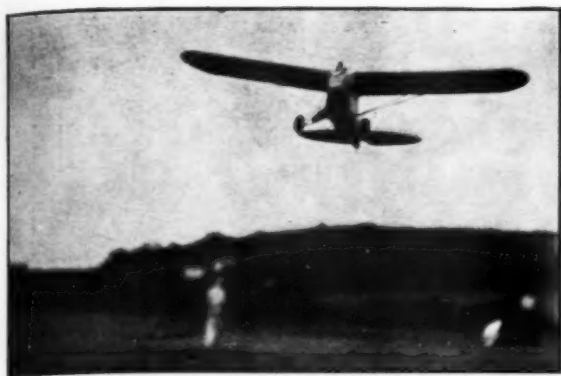
In answer to a request made by MODEL AIRPLANE NEWS for suggestions concerning the rules for gas models, many diverse opinions have come in to us. It appears that each section or community throughout the country has specific ideas on the subject. These ideas primarily originate from the conditions under which these model build-

ers have to fly or from the field of their general training in gas model building and flying. Of course, national rules made to please one community may not please others. It becomes evident therefore that the safest policy, in our opinion, is to provide general national rules which will govern all communities, and allow the various sections throughout the country to establish more detailed rules which will apply to their particular flying conditions and desires. In this way everyone will have a larger scope of action along the lines in which he wishes to go.

A series of events could be established for record purposes by the National Aeronautic Association, which would embody any form of flying in which the various communities would wish to participate. Other events for the general national rules could be established for national contests. Unquestionably this would prevent long, drawn-out discussions and would allow ex-

perience over a period of time to dictate what the national rules should be in a more specific sense, if it should be desired at any time, that these national rules should be established on a more detailed basis.

At the present time it appears as if the last year's rules, generally speaking, will be continued in effect for 1939. Many leaders feel that greater ex-



Pict. No. 2. It's hard to tell this "Cub" from a full size plane. Sam Poole built it

perience should be had before any decision is made concerning the change of these rules. However this, as yet, is not definite.

At least let us stay away from rules which limit the scope of activity of gas model flying to such an extent that it will retard experiment; for after all, experiment is the essence of the joy and value of this educational sport.

Take a look at picture No. 1 at the head of the column and tell us whether or not this is a real ship or model. What do you think? Well, it is hard to believe; but actually it is a Stinson Reliant gas model snapped a few seconds after the takeoff. The plane has a 47-1/2" wing span and is powered with a 1/8 horsepower inverted Husky engine. It has made flights of more than seven minutes on 1/16 ounce of gas. Its weight, ready to fly, is three pounds. The ship was built from an enlarged set of plans for a twenty inch flying scale model. Mr. Charles W. Eilermann of 43 West Corry Street, Cincinnati, Ohio, is the builder. He tells us that immediately after the flight shown in the picture the plane was sold to a spectator for enough money to build three more like it. This might be called "Salesmanship minus words."

Picture No. 2 is another excellent flight shot. Here you see Samuel Poole's "Cub" gas model taking off. The photographer, Mr. A. J. Norkus, was kneeling at the end of the run-way and had to snap the picture and quickly duck his head as the plane passed over him. Poole, who lives at 400 Motheral Avenue, Monessen, Pa., says that though his Cub is fairly heavy due to hard wood construction, when powered with the old Cyclone Model "A," it is the most reliable and steadiest flier he has ever built. It has a remarkable glide and rapid climb. The weight of the com-



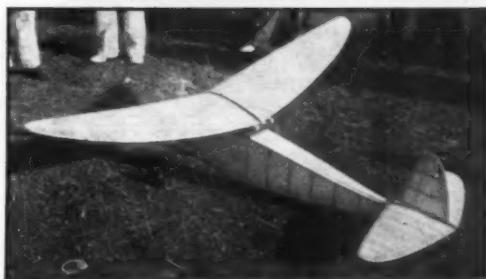
Pict. No. 3. Proving that KGs still fly. The builder, Ronald Scholes, watches

pletely finished model is four pounds.

It appears that KG's are still flying; for here, in picture No. 3, we have a remarkable flight shot of one taking the air at the Pittsburgh-Butler Airport during a contest held last summer. Mr. Charles E. Scholes of the Tri-State Model Association, 524 Griffin Street, Pittsburgh, Pa., was kind enough to send us this photo. The ship was built and flown by Ronald Scholes.

Here we have news from Mr. Winston B. Mackley of 20 Ascot Avenue, Remuera S.E. 2, Auckland, New Zealand, who is Hon. Secretary of the Auckland Model Aero Club. He sends us picture No. 4, which shows his first gas model of his own design. He says it performs very well but is a little heavy for the Cyclone motor with which it is powered. It weighs 4 1/4 pounds and has a span of six feet with a chord of

(Continued on page 54)



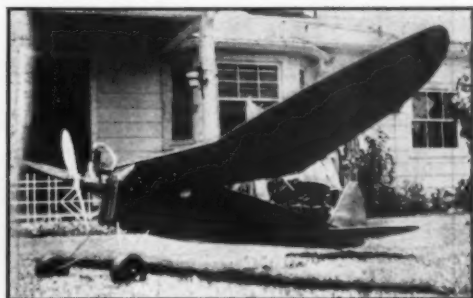
Pict. No. 13 and No. 14. Bob Rutledge and his two planes that are winning many contests down in Texas



Pict. No. 12. One of the most stable, streamline jobs we have seen, by Alex Johnson



Pict. No. 10. Members of the Stewart Model Club at Newburgh, N. Y.



Pict. No. 11. Bill Condermann's Miami, Fla., winner

WRIGHT "WHIRLWIND" 420 H.P.

60 SCALE: $\frac{1}{16} = 1" - 0$ DRAWN BY: WILLIAM A. WYLAM

Y	OIL PRESSURE GAUGE CONN.	A	OIL LUBRICATION LINE
Z	OIL SUMP ENTRANCE	B	EXHAUST PORTS
A	FELT PADS	C	WIRE HARNESS
B	CASTLE NUTS	D	INTER-CYLINDER BAFFLE
C	PROG. HUB RETAINER NUT	E	CYLINDER-HEAD BAFFLE
D	PROG. HUB FRONT CONE	F	LEATHER STRIPS
E	PROG. HUB TAPER RING	G	GENERATOR DRIVE CONN.
F	..COLORS..	H	STARTER CONN.
A	GOLD	I	OIL ENTRANCE CONN.
b	DULL BLACK	J	OIL EXIT CONN.
C	DULL BROWN	K	OIL PRESSURE ADJ. CONN.
d	DULL BLUE GREEN	L	OIL THERMOCOUPLE CONN.
e	RED ORANGE	M	FUEL PRESSURE CONN.
F	SHINY BROWN	N	GUN SYNCHRONIZER CONN.
G	SHINY BLACK	O	VENT TO OIL
H	ALUMINUM	P	MAGNETO
I	COPPER	Q	CARBURATOR
		R	THROTTLE CONN.
		S	INTAKE PIPE
		T	CONTROL. PROG. VALVE
		U	50F. "30 SPLINE
		V	MOUNTING BOLT HOLES
		W	BRAIDED WIRE SHIELD
		X	CARBURATOR HEATER

WHEN COLLECTOR RING IS INSTALLED, REVERSE THE ENTIREWARD THE PROPELLOR HUB.

FRONT VIEW OF COLLECTOR RING

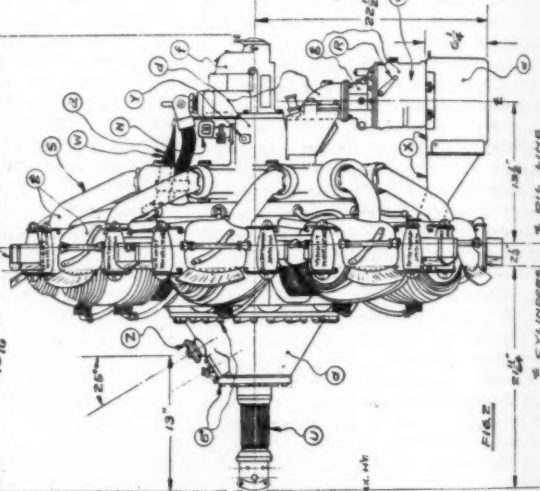
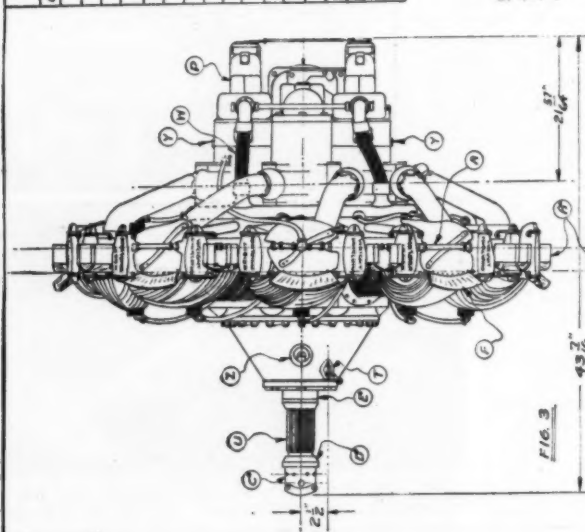
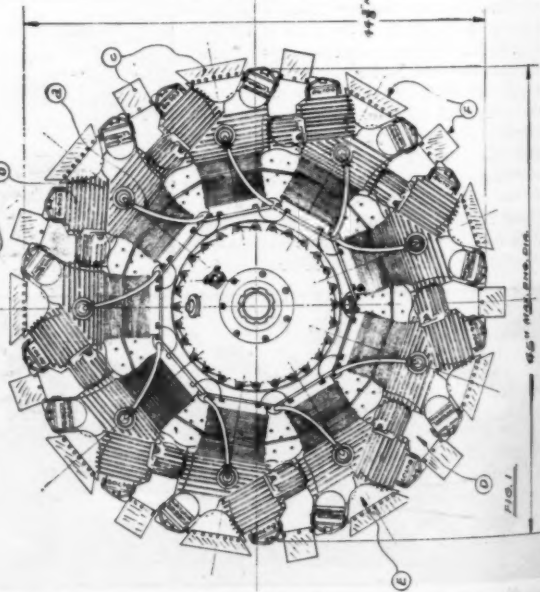
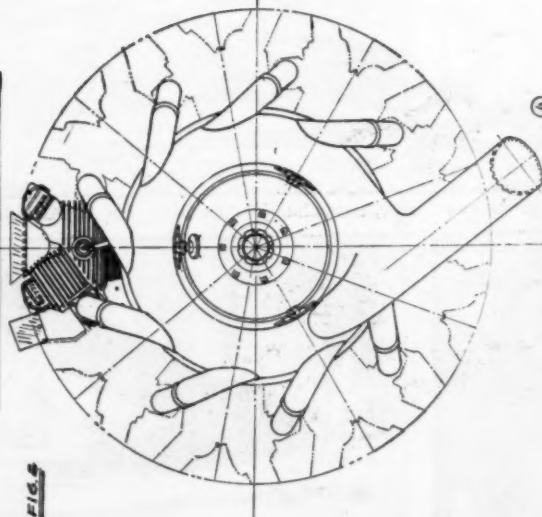


FIG. 4

"WHIRLWINDS" IN MINIATURE

The History of the Wright Whirlwind Engines
and How You Can Create an Exact Scale Miniature of One for Your Model

By WILLIAM WYLAM

THE design of the Wright "Whirlwind" was first conceived in 1924. In its period of developments and experiments it was called a complete success by its first feat that attracted world wide attention. This was on May 9, 1926, when Commander R. E. Byrd and Pilot Floyd Bennett flew a tri-motored Fokker, powered by Whirlwinds, from Spitsbergen to the North Pole and return. This trip proved the reliabilities of the Whirlwinds under all kinds of operating conditions; and started a series of famous Whirlwind flights that made history. Lindy and his Whirlwind-powered Ryan made the most memorable flight of all: his New York-Paris non-stop hop. Then came Clarence Chamberlain, who flew non-stop from New York to Germany in his Whirlwind-powered Bellanca monoplane. These are only a few of famous Whirlwind flights which have made history over and over. These flights are proof of the reliabilities and dependabilities of Wright's products. Not only did these famous flights prove to the world its dependabilities, but its qualities were shown in the millions of miles flown by airplanes, powered by Whirlwinds, in the transportation of passengers and air mail. Today, Wright Whirlwinds are used throughout the world in many types of private, military and commercial airplanes.

Description of the Wright "Whirlwind"

The "Whirlwinds" are divided into four classes: five cylinders of 165 horsepower, seven cylinders of 240 horsepower and nine

cylinders of 300 and 420 horsepower. Each type can be optionally equipped with a rear exhaust or a front exhaust system. All types have the same cylinder design, the same gear housing and the same rear section, with the exception of minor electrical changes. When the supercharger's ratio is changed, the horsepower is changed, making some models of the same type having different ratings from the standard types.

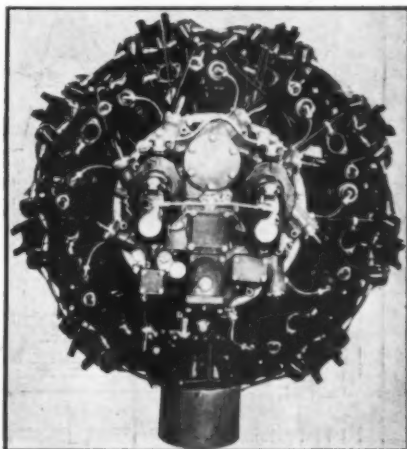
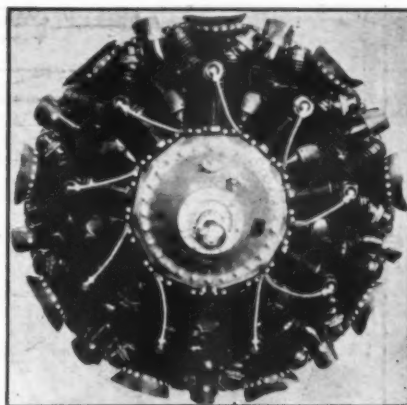
When rear exhaust models are chosen, the exhaust pipes are manufactured by the airplane's manufacturer and the design of the pipes are so numerous that it is almost impossible to show illustrations. Some manufacturers equip the Whirlwinds with single-bolted exhaust pipes, some use single exhaust pipes that are connected to two exhaust ports and some makes a rear ring exhaust collector. When a front exhaust system is chosen, the engines are equipped with a standard ring collector manufactured by the Wright Aeronautical Corporation.

Cylinders

The cylinders are built up of a forged steel barrel and a cast aluminum head of Wright design. The fins are cast integral with the cylinder head to provide cooling for the exhaust valve and combustion

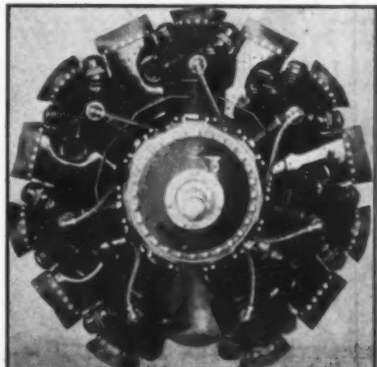
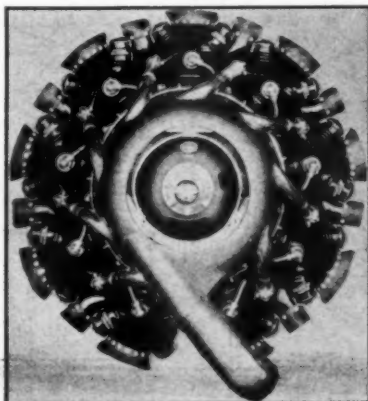
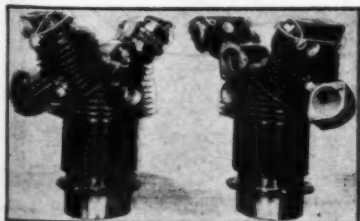
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Right, top: Front view of a 9-cylinder Whirlwind. Below this are two views of the rear of this engine showing the carburetor and magnetos

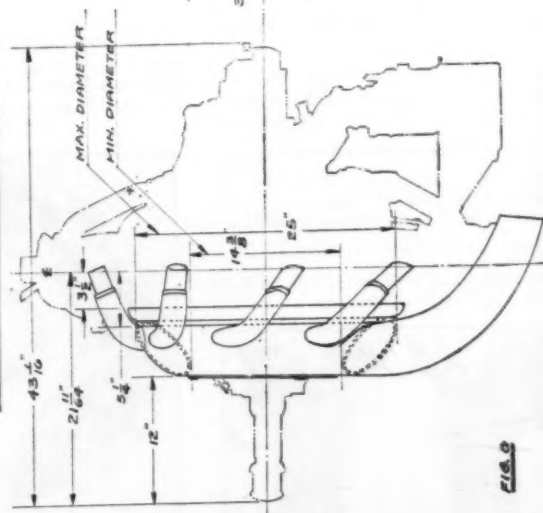
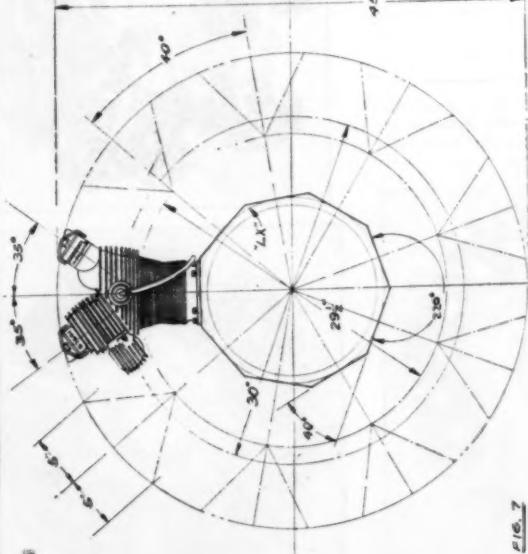
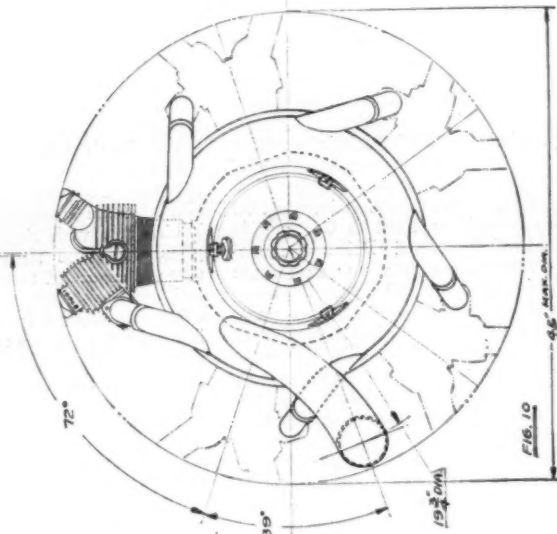
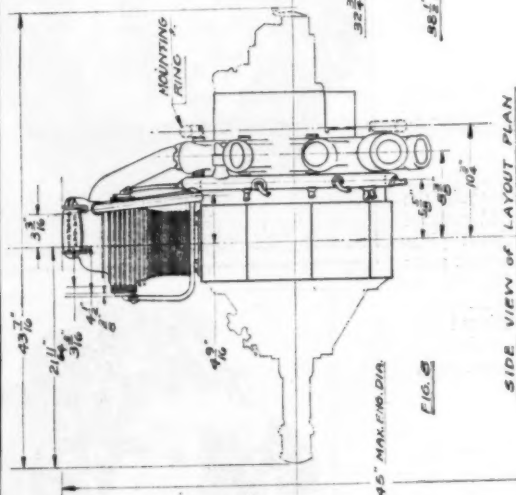
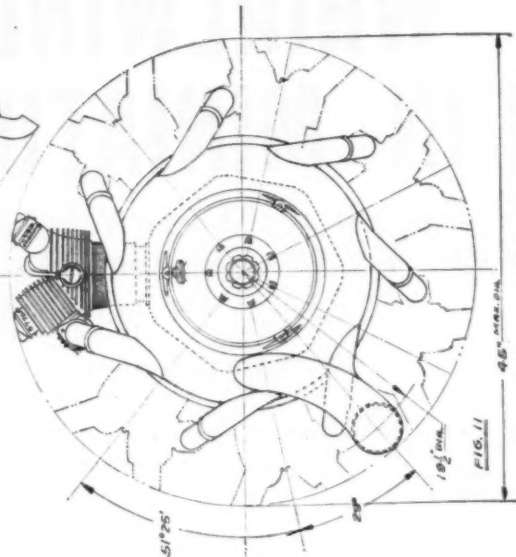
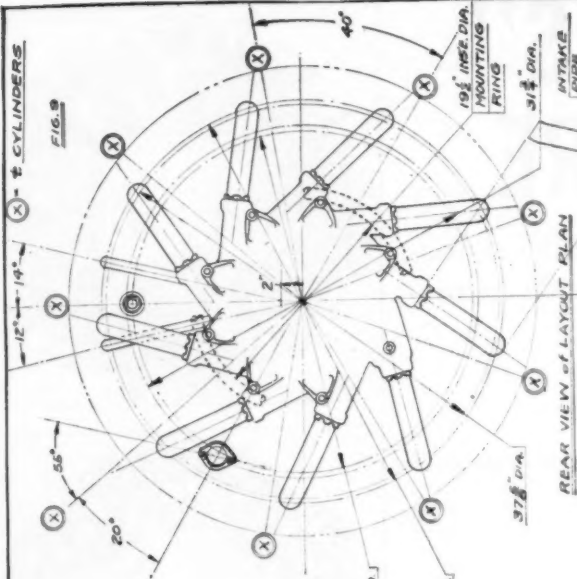


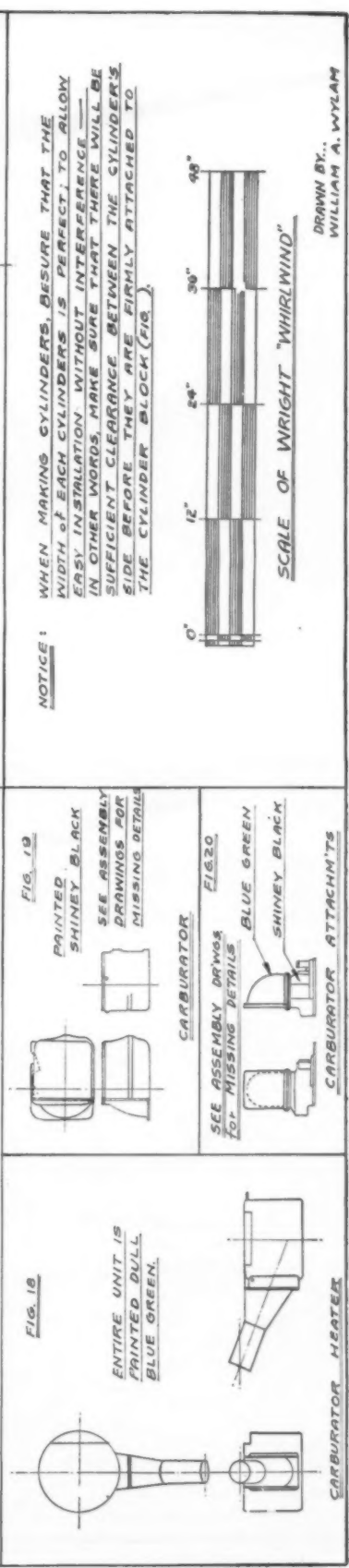
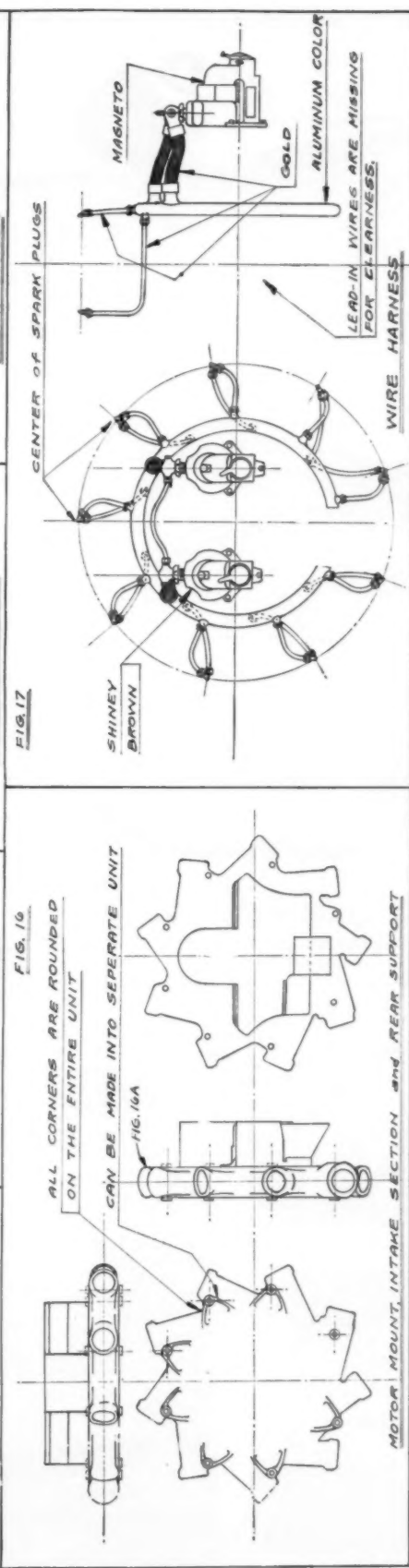
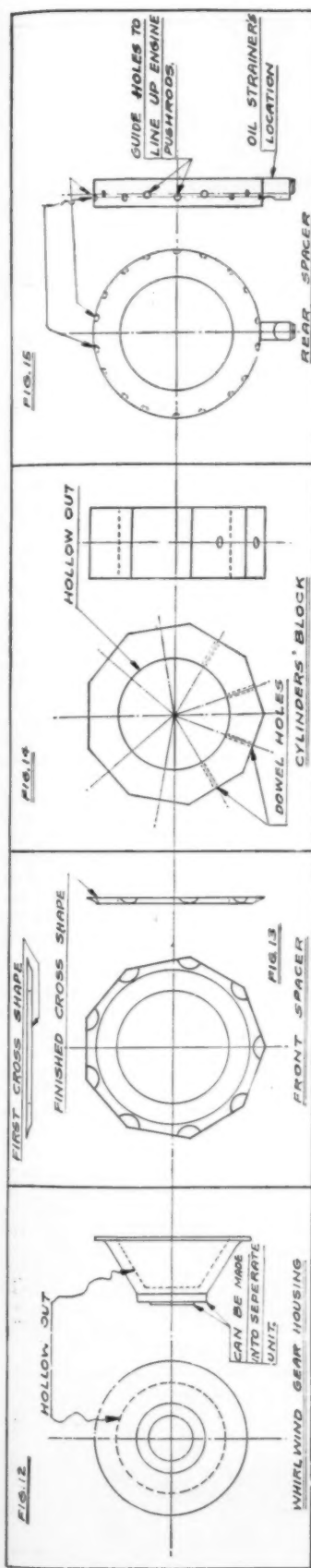
Extreme right: Front view of the 420 hp. rear exhaust Whirlwind. Right: The same engine with a front exhaust manifold

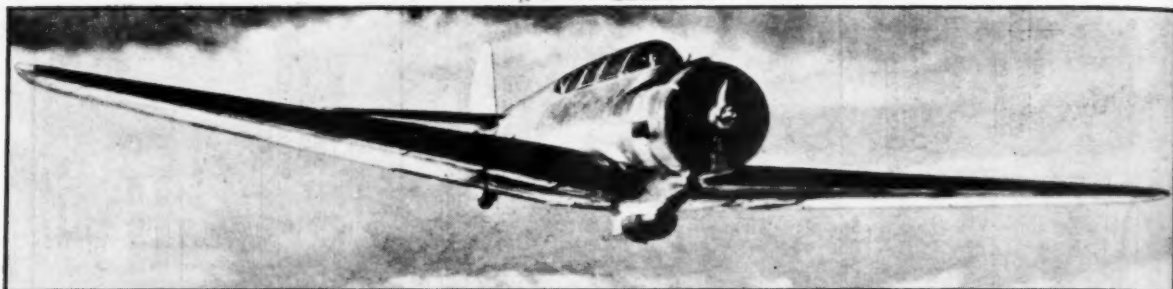
Below: Individual cylinders of the Wright Whirlwind engines



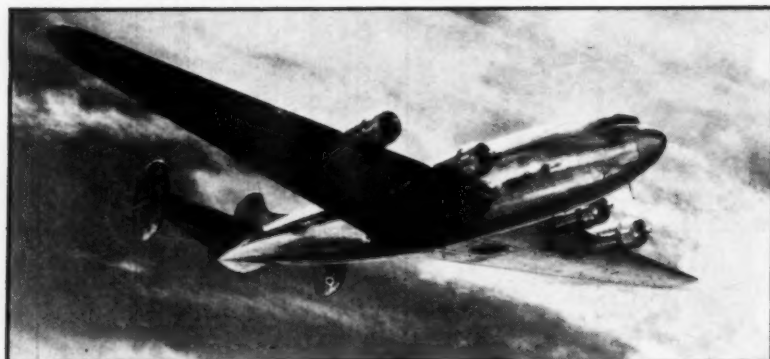
(X) - 4 CYLINDERS



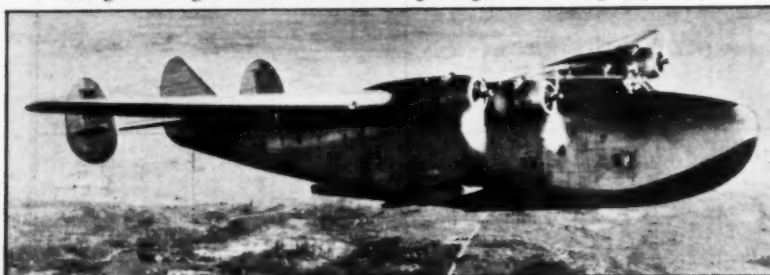




The 1000 hp., 243 m.p.h. Vultee V-12 attack bomber, one of the most versatile military planes in the world. (Internat'l)



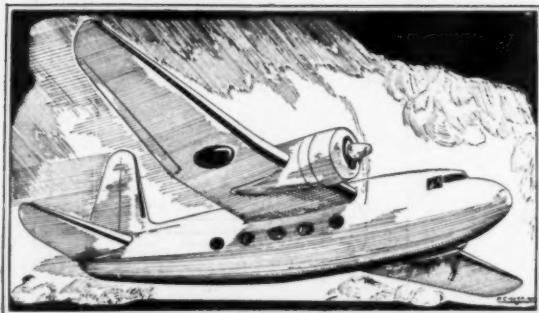
The giant Douglas DC-4. It carries 44 passengers at 240 m.p.h. (Globe)



The largest flying boat in the world, the Boeing Clipper, carries 74 passengers. Here you see the 6000 hp. craft on one of its test flights

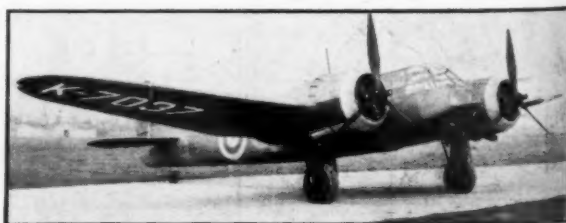


(Left)
The Curtiss SBC-3, two seat scout-bomber. The navy has a lot of these



THE PROPOSED DOUGLAS DC-5

(Below)
One of the fastest bombers in the world, the Bristol Blenheim medium bomber. Its top speed is 279 m.p.h. with two 840 hp. engines. (Monk-meyer)



By ROBERT MORRISON

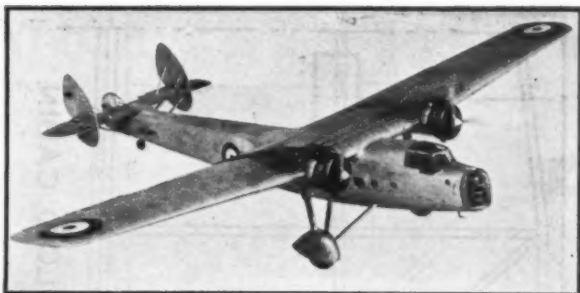
THIS contemplated sudden expansion of our air force is almost a certainty. Whether actually 12,000 airplanes are ordered or not the number will be well within that range. And typical of that old phrase, "when it rains it pours," we are apt to see Louis Johnson take Harry H. Woodring's place as Secretary of War! Having Mr. Louis Johnson in that distinguished position is the equal of having Col. Lindbergh as Secretary of War, for Mr. Johnson is truly an air corps enthusiast. Then we now have General Arnold as head of the U. S. Army Air Corps, and he is a very strong advocate of making the air force a separate unit from the army and navy. So watch out! . . . Aviation may gain its rightful place in the militaristic field after all.

The airplane manufacturers in the United States are well prepared to build the 12,000 planes when ordered, but the greater problem in this enterprise is the training of pilots and mechanics to fly and maintain these planes. Undoubtedly commercial flying schools will be called upon to help the Air Corps in the task. Thus not only will tactical airplanes be ordered, but also a greater supply of training planes.

But what will all this activity have to do with the design of new aircraft? The answer is that there will probably be very little. Of course it will put more money into the manufacturer's coffers which will promote the development of more experimental planes, but nearly all the airplane manufacturers are working on "super" war-planes now that require the ultimate of the designer's knowledge. Furthermore it is very likely that the planes ordered will be done on a contract-order basis and not by the present competitive bidding. They will be planes already in the process of design or construction, and newly formed companies endeavoring to take advantage of the sudden splurge will be disregarded. The army has already called for planes



The new 17 passenger DeHavilland "95" Flamingo (Monkmeyer)



The Bristol Bombay Transport can carry 24 soldiers

FRONTIERS OF AVIATION

with speeds up to 380 m.p.h. so what more could be expected? . . . ! There is one probable outcome that these orders will encourage more training plane designs, and there is one prominent company entering this field now which is mentioned further in this article. There is one more point. These large orders may mean the survival of many more than one design entered in the attack-bomber competition in March. Other probabilities are that the army will be equipped with hundreds of planes of the new fighter type, such as Bell is building now. The name of the pursuit airplane may be changed to interceptor, attack-bombers may be called light bombers, bombers in the B-18 class may become medium-bombers, and those in the four-six engined class would be called heavy-bombers. The attack airplane as it is today will remain an attack ship.

The War Department is in a dither now as to the method of purchasing airplanes, and competitive bidding may be discarded altogether. Instead, experimental models will be ordered and paid for by the army, and if successful they will then be ordered in quantity.

And the final outcome of all this expansion will be the revival of that old argument as to whether or not aviation should separate from the army and navy to become an independent unit, to be more powerful and effective than the army and navy forces

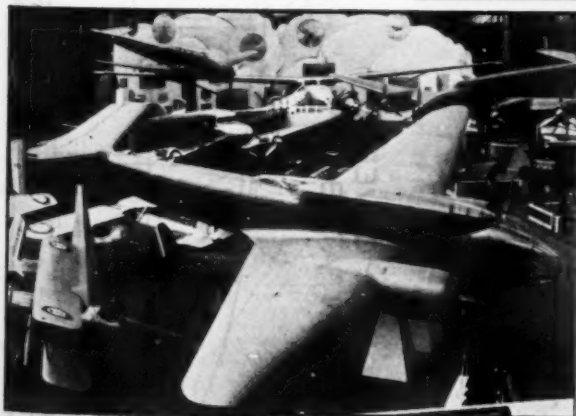
ever were. Mark our words; this will crop up again in the near future, and it may actually develop this time!

(Continued on page 42)

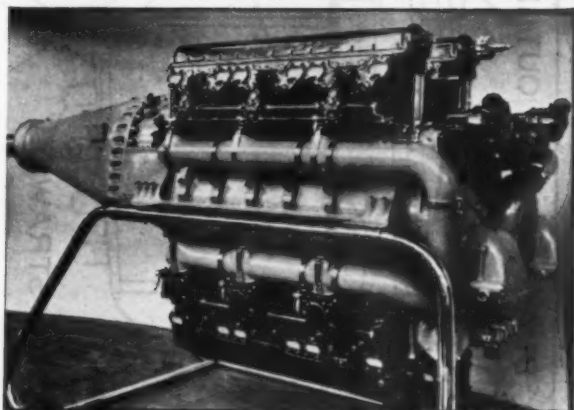
An artist's conception of a future 100 passenger Boeing Clipper leaving New York for Europe



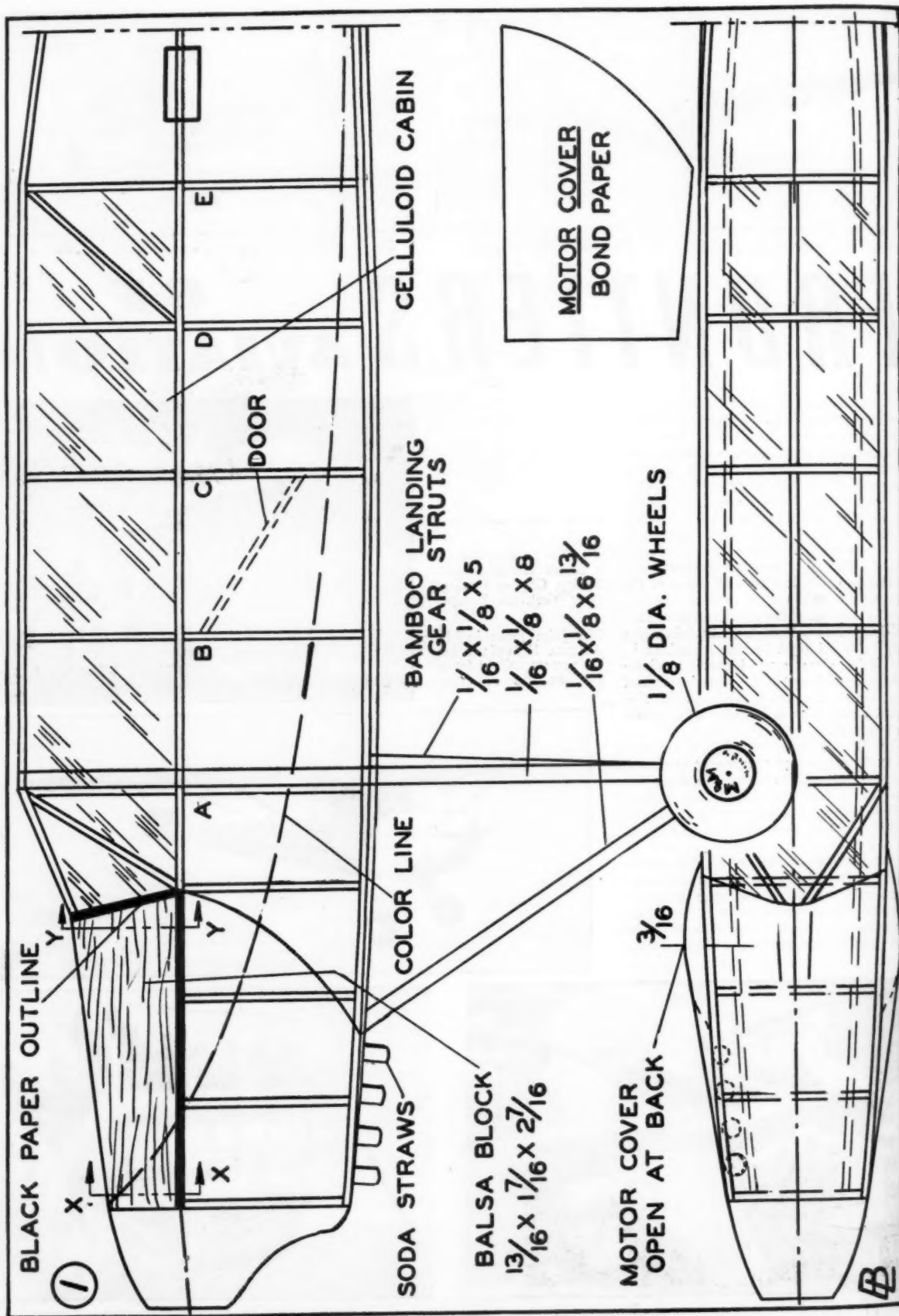
Mr. John Jones in his Aeronca light-plane on his non-stop flight from Los Angeles to New York



The 300 m.p.h. Loire et Olivier at the Paris Air Show. (Acme)



A 24 cylinder 2600 hp. Hispano-Suiza motor. (Acme)



A HIGH PERFORMANCE PUSS MOTH

How You Can Build a Scale
Model That Will Make Con-
sistent Flights of Five Minutes
Or More

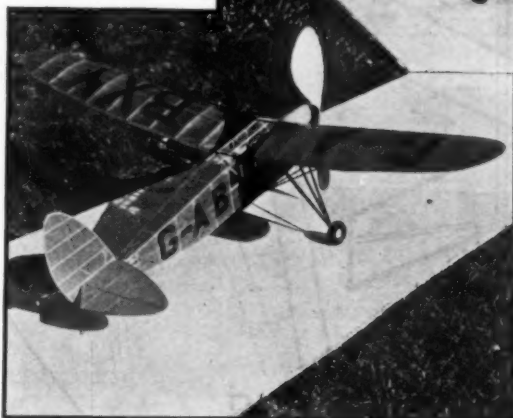
THE flying qualities of any model depend more upon good design than upon mere motor power. Stability is the first consideration in selecting an airplane type of which you are to build a model. Therefore when you look over the list of large planes this should be kept in mind and a design selected that you are sure will produce plenty of stability.

The Puss Moth is a type which fulfills every requirement in this respect. The fuselage is quite long in proportion to the wing span; the wing is well above the center of gravity, and the general character of the plane lends itself to stability. Therefore the Puss Moth was chosen as an outstanding type for model work. The model itself has been carefully designed and the measurements have been held very close to the scale and pro-

Here are several views of the completed ship that disclose its fine proportions. This ship is not only a scale model but it has that "flying" look that only a fine performer possesses. Note the large propeller



By CHESTER LANZO and LEONARD BECKER



Assemble the two sides with 1/16" square balsa cross members, the size of which may be measured from the top view. After the square section of the fuselage is completed, cement the 1/16" square bottom and side stringers in place; the bottom stringers running the length of the fuselage, while the side stringers run

from the back of the cabin to the tail. Between uprights "A" and "E," cement 1/16" square balsa uprights to the inner sides of the fuselage, to strengthen the cabin. The motor cowl is carved from a balsa block 13/16" x 1-7/16" x 2-7/16", the sections of which are shown on Plate No. 3. The nose-plug is made of two pieces of balsa, the size of which is shown on Plate No. 4. The shape of the front piece may be obtained from Plate No. 1, in the top and bottom views. The shape of the back piece may be obtained from Plate No. 4.

Wing

First cut 1/32" balsa rib to shape from templates on Plate No. 2, then cut the 1/16" square wing spar slots. The leading and trailing edges and bottom spars are then pinned to the plan, after which the ribs and top spars are cemented in place. The wing tips are 1/16" square bamboo, which are formed around a hot tin-can. After the two wing panels are thoroughly dry, they are assembled with two pieces of 1/16" diameter steel wire, being careful to get the right amount of dihedral and sweep-back. The edges are then streamlined.

Tail Surfaces

The outline of the rudder and stabilizer are cut from 1/16" thick sheet balsa and pinned to the plan, after which the 1/16" square cross members are cemented in place.

Landing Gear and Tail Surfaces

Landing gear struts are made of 1/16" x 1/8" bamboo, the measurements of which may be obtained from Plate No. 1. These
(Continued on page 31)



Climbing steadily after the take off

portion of the original large ship.

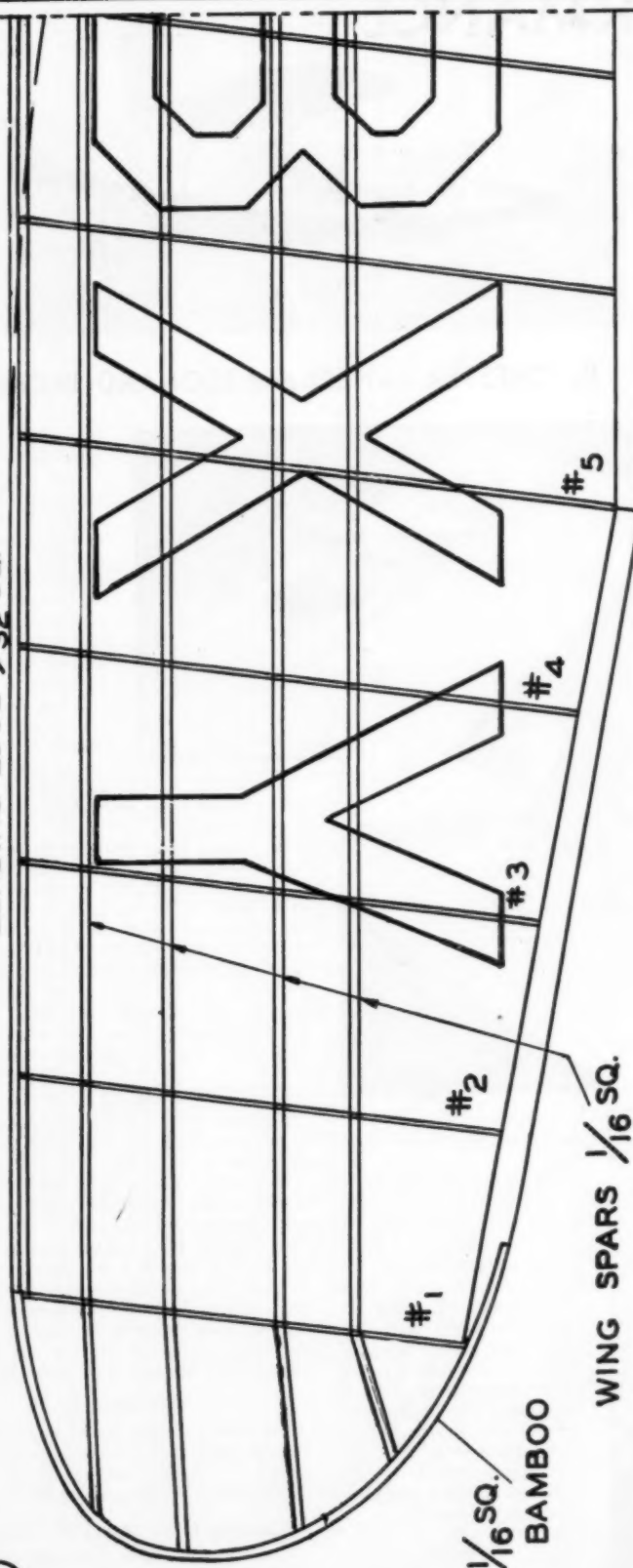
The choice of this model by Chester Lanzo for entry in the 1938 Scripps-Howard Junior Aviator Contest proved to be a wise one, for he placed third with a flight of one minute, fifty-eight seconds. The model, since that time, has made unofficial flights of over five minutes, nearly going out of sight. It is probably one of the most unusual scale models, from a flying standpoint, that has ever been presented. In fact it is a scale model that gives contest performance.

Fuselage

Build the two sides of the fuselage right on the drawing, using 1/16" square balsa.

②

LEADING EDGE $\frac{3}{32}$ SQ.



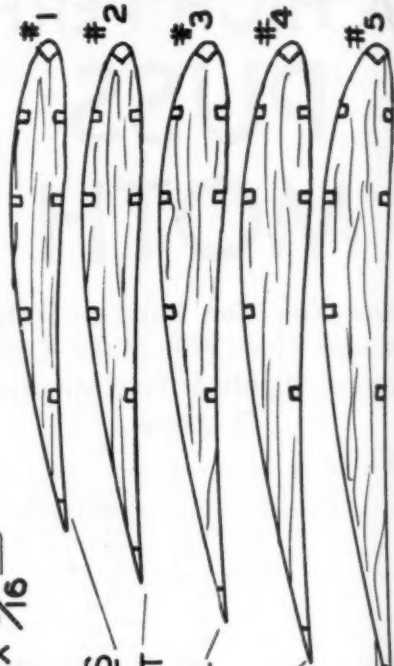
WING SPARS $\frac{1}{16}$ SQ.

TRAILING EDGE $\frac{1}{16} \times \frac{3}{16}$

WING RIBS

$\frac{1}{32}$ FLAT

2 EA. REQ.



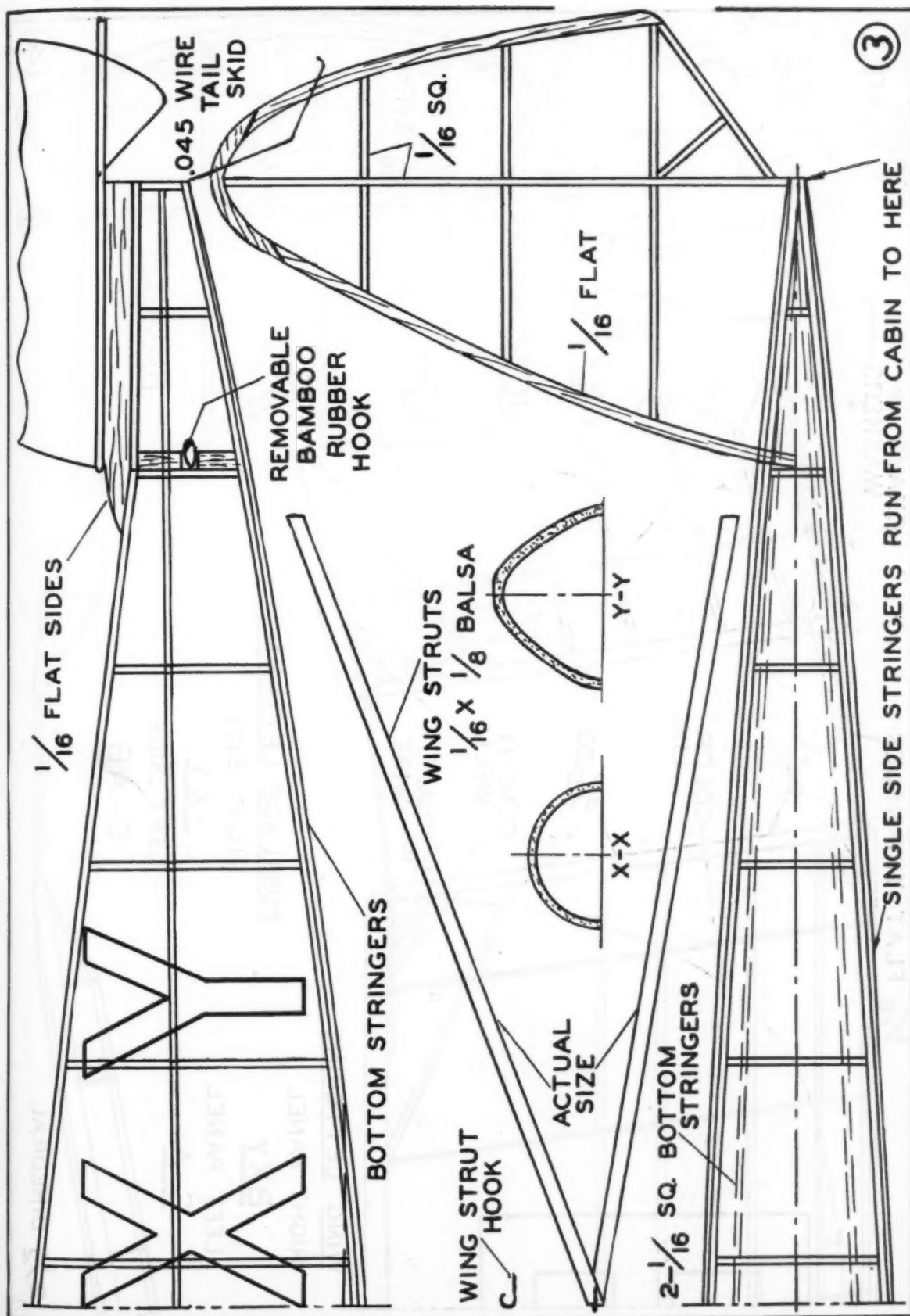
10 REQ.

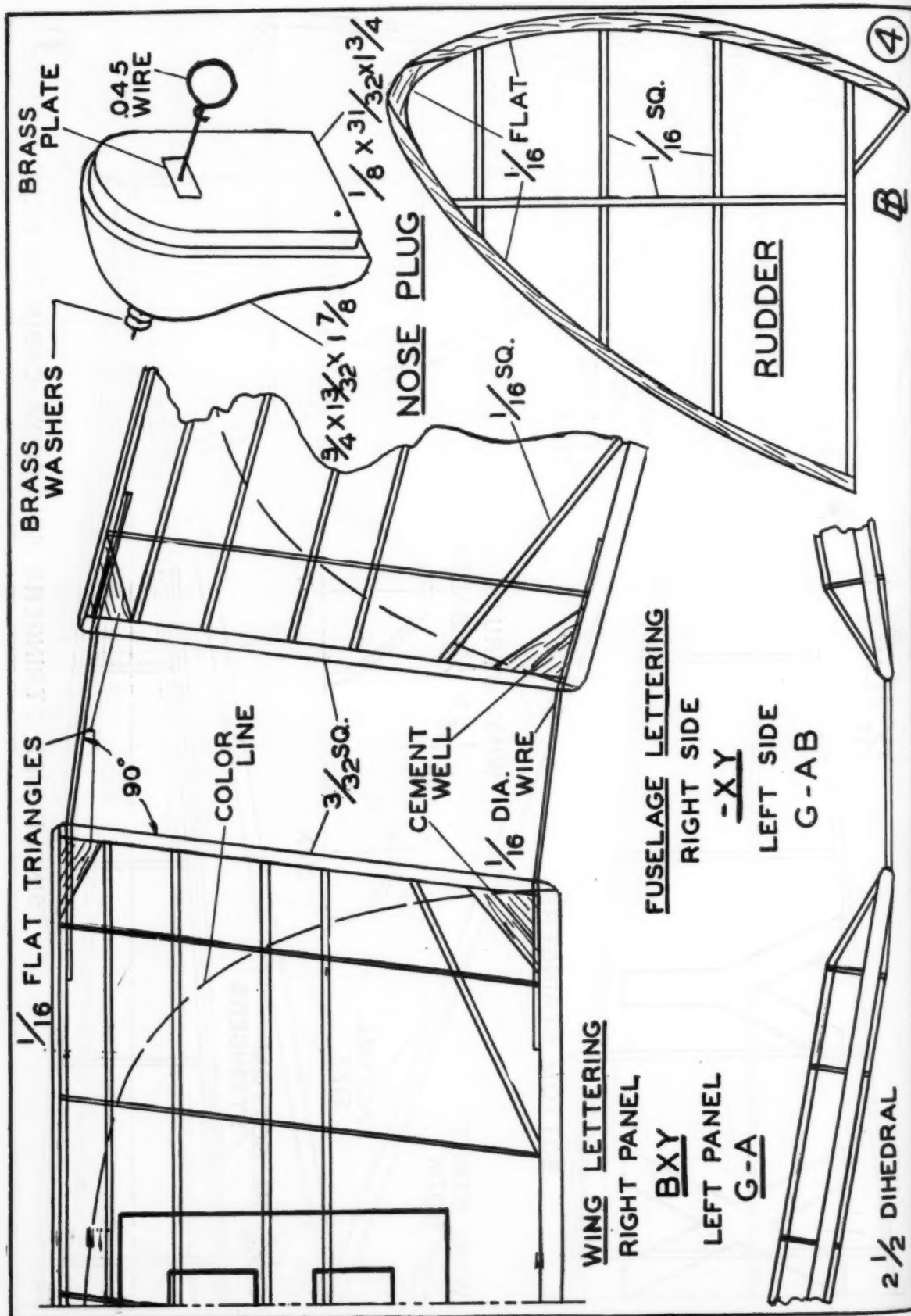


PROPELLER
TEMPLATE

PROPELLER BLOCK $1\frac{1}{2} \times 1\frac{1}{8} \times 8$

ⓑ





DESIGNING YOUR GAS MODEL

Chapter No. 5 Article No. 83

IN THE last article of this series (No. 82), the pitch, diameter and blade width of the propellers for planes No. 1 and No. 2 were determined by two different methods: 1. By means of the tables. 2. By means of the graphs given in previous articles.

These factors may be determined also by solving a simple formula. Though the first two methods will give the correct values only in special cases, in which the normal engine speed is 4000 revolutions per minute, the formula method may be used to solve the problem in any case that may arise. The formula is as follows:

$$Cu (V_M) = (0.000000305)^2 (V_F)^3 P W_B D^5$$

In the formula: Cu = the piston displacement in cubic inches; V_M = the engine revolutions per minute when developing its maximum power; V_F = the propeller revolutions per minute when the engine is turning at V_M ; P = the propeller pitch required; W_B = the blade width necessary and D = the diameter of the propeller.

When all the values (represented by the formula symbols) but one are known, the formula may be solved. Let us see which ones are known and the ones that must be determined before the formula may be used to give the value of the final unknown quantity.

First of all, it has been decided in previous pages that a 1/5 horsepower engine is to be used in each of the two planes, No. 1 and No. 2. Therefore some particular engine now must be selected. As an example let us assume that the engine chosen has a piston displacement of 0.6 cubic inches and the normal running speed is 4000 R.P.M. Thus we know that (Cu) = 0.6 and (V_M) = 4000.

The velocity at which the propeller is to turn is the next consideration. Usually propellers are mounted directly on the end of the engine crankshaft. In such cases the propeller turns at the same speed as the engine. This is the simplest system but not the most efficient; for the slower a propeller turns, the more efficient it is. A slow-turning propeller however must be made larger in diameter to absorb the power of the motor. As plane No. 2 is a comparatively small ship, the diameter of the propeller should be as small as possible without loss of efficiency. This makes it advisable in this case to mount the propeller directly on the engine shaft.

Plane No. 1 is a larger plane, however, and a larger propeller could be used effective without necessitating an extremely long landing gear. Therefore it will be assumed that the propeller on plane No. 1 will run at one-half motor speed, a one to two reduction gear arrangement being used. In this way from 20% to 25% greater thrust will be obtained.

Therefore for plane No. 1 the propeller

How to Determine the Design Characteristic of Any Gas Model Propeller—How to Lay Out the Propeller—Complete Specifications for High Performance Gas Models

By CHARLES HAMPSON GRANT

speed will be 2000 R.P.M. or (V_F) = 2000. For plane No. 2, (V_F) = 4000.

The next factor in the formula that must be known is the propeller pitch. This may be determined by means of the following formula:

$$P = \frac{P_F (1056)}{r.p.m.}$$

In the formula P = the pitch in inches; P_F = the pitch speed in miles per hour; and (r.p.m.) = the rotational speed of the propeller.

The pitch speed should be (1.5) times the normal level flight speed of the airplane. This may be calculated by means of the formula on page No. 27 of the February issue, or determined by means of the graph, page No. 17, November, 1938, issue. The method of determining the speed from the graph was given in the February issue. It was found that the speed of plane No. 1 would be 17.75 miles per hour and plane No. 2 would have a speed of 18.5 miles per hour.

Therefore the pitch speed of propeller No. 1 would be (1.5 x 17.75), or 26.44 miles per hour and the pitch speed of propeller No. 2 would be 27.75 miles per hour.

Now the pitch value of each propeller may be found by inserting the correct values of (r.p.m.) and (P_F) in the formula for pitch (P), as follows:

For propeller No. 1:

$$P_1 = \frac{26.44 (1056)}{2000}$$

or the pitch (P) = 14.06 inches.

For propeller No. 2:

$$P_2 = \frac{27.75 (1056)}{4000}$$

or the pitch, P_2 = 7.4 inches.

You will observe that propeller No. 1, which turns at one-half engine speed, must have a pitch which is twice as large as a propeller should have when it revolves at the same speed as the engine.

So far all the factors in the formula for propeller characteristics have been determined except the blade width, W_B , and the diameter, D . As we have learned from previous discussion W_B should be from 1/8 to 1/10 the diameter of the propeller. Therefore W_B may be expressed in terms of D . A value for W_B of 1/10 the diameter is an efficient ratio, so this will be selected. Then: $W_B = D/10$.

Thus the only unknown quantity in the formula now is D . By inserting the correct known numerical values in the formula, this quantity may be determined by solving the equation. Proceed as follows:

For Plane No. 1.

$$(0.6) (4000) = (0.000000305)^2 (2000)^3 (14.06) (D/10) D^5 \text{ Simplifying:—}$$

$$D^4 = \frac{24}{(0.000000305)^2 (8,000,000) (14.06)}$$

$$\text{or, } D^4 = \frac{24}{(0.0001045)} = (229,665),$$

$$\text{or, } D = \sqrt[4]{229,665} = \sqrt[4]{479.5}.$$

or, D = 21.9 inches, or approximately 22 in. Then $W_B = \frac{22}{10} = 2.2$ inches (Blade Width).

The characteristics for propeller No. 1 are:—Pitch = 14 inches; Diameter = 22 inches; Blade Width = 2.2 inches.

If the model designer prefers to have the propeller driven at engine speed, he may calculate the correct diameter by following the same procedure, except that the value of (V_F) in the formula should be (4000), and the pitch should be equal to:—

$$P = \left(\frac{2000}{4000}\right) (14.06) = \left(\frac{14.06}{2}\right),$$

or, P = 7.03 inches.

The correct diameter and blade width for propeller No. 2 may be determined by means of the same formula as used in the case of propeller No. 1. The equation will appear as follows, when the known numerical values are inserted in it.

$$(0.6) (4000) = (0.000000305)^2 (4000)^3 (7.4) D/10 (D)^5,$$

$$\text{or, } D^4 = \frac{6}{(0.000000305)^2 (16,000,000) (7.4)}$$

$$= \frac{1}{(0.00000031) (59.2)} \text{ or } \frac{1}{(0.00001836)}$$

$$= (54,500) \text{ or } D = \sqrt[4]{54,500}.$$

Then, $D = \sqrt[4]{234}$, or D = 15.3 inches.

As (W_B) = $D/10$, then W_B = 1.53 inches.

Thus the characteristics for propeller No. 2 are: Pitch = 7.4 inches; Diameter = 15.3 inches; Blade Width = 1.53 inches.

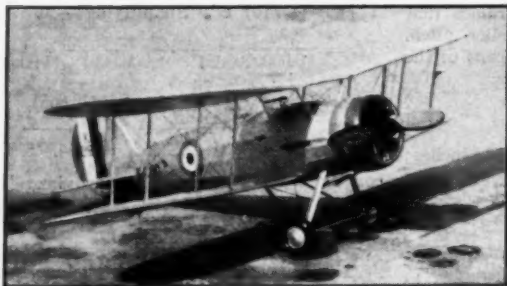
Calculation of Propeller Block Dimensions

Now that the correct characteristics of the propeller are known, how can the propeller be carved so that it will have the correct values of pitch, diameter and blade width, when finished? The method that will insure the greatest accuracy in respect to the desired specifications, and the least trouble, is the *Diagonal Method*, described at length in the January, 1939, issue.

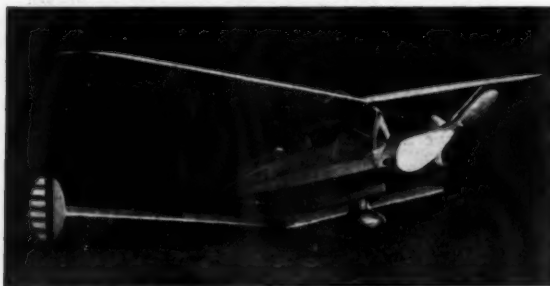
Under this system the propeller is cut from a rectangular block, the dimensions (Continued on page 52)



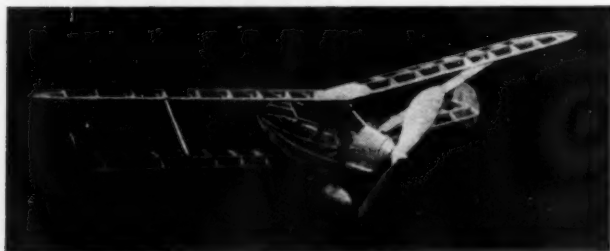
Pict. No. 1. William Chana's scale Douglas DC-2



Pict. No. 2. A perfect scale Gloster Gauntlet. (Barlow)



Pict. No. 3. R. F. Parkhill's Design Contest winner



Pict. No. 4. Parkhill's model before the covering was applied



Pict. No. 5. Jesse Davidson "explains" to Louise Campbell, star of "Men With Wings"



Pict. No. 6. A little activity at the annual hydro contest held by the Springfield and Westfield, Mass., Model Club. Mr. Ernest Walen is the club director. (3rd from left)

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World

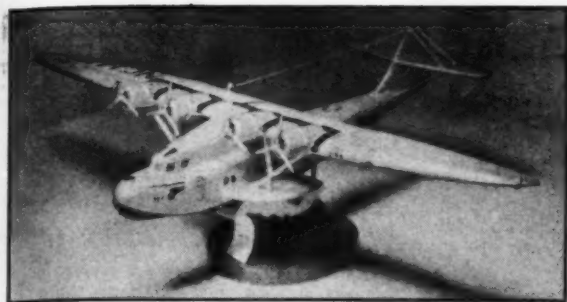
OUR scale model builders have been "fooling the public" again. This appears to be their favorite pastime, especially if the so-called public consists of some aeronautical expert who is supposed to know everything about aviation. Apparently this gives the model builder a feeling of greater importance and extends to him the hope that he knows something about aviation himself.

As a matter of fact, our young model builders of today have an immense store of aviation knowledge which will be of great value to them personally if they intend to follow an aviation career, incidentally, to their country in case it is necessary to render it service along this line. As a rule, older sages in aviation have very little conception of the amount of knowledge pertaining to this subject that the younger generation possesses.

William F. Chana of 1507 South Oak Park Avenue, Berwyn, Illinois, is one of the builders who has apparently nonplussed aviation officials. He sends us picture No. 1, a close-up of his scale Doug-

las DC-2. Not only is the model complete in every detail, but the lighting effect gives it a very realistic appearance. A picture of this model, posed on an airport in front of TWA's hangars completely fooled TWA officials; they thought it was a picture of a full scale plane. We can readily understand their confusion. This little plane won Mr. Chana a trip to the TWA shops in Kansas City, Missouri. Then, TWA purchased it, placing it in the famous "21 Club" in New York City. The model has retractable landing gear, movable controls and the cabin is constructed to the finest detail. The structure includes 3150 individual parts and required over 200 hours to build.

Mr. J. A. Barlow of 1521 Prairie Avenue, Hawthorne, Calif., is the proud parent of the "brain child" shown in picture No. 2. The little ship is a scale Gloster Gauntlet of twenty-one inches wing spread; finished in silver and blue. Its equipment includes an electric motor, which turns the propeller at idling speed. There are also a complete dashboard, controls and gun-sights of both telescopic and cross-hair types. All bracing and control wires are made from wire and not thread. Other details include machine guns, exhaust stacks, bomb racks and lights. This is one of the finest scale jobs we have seen. Not only has it many details, but the workmanship is unexcelled.



Pict. No. 8. A scale Martin Clipper by Edwin Poole



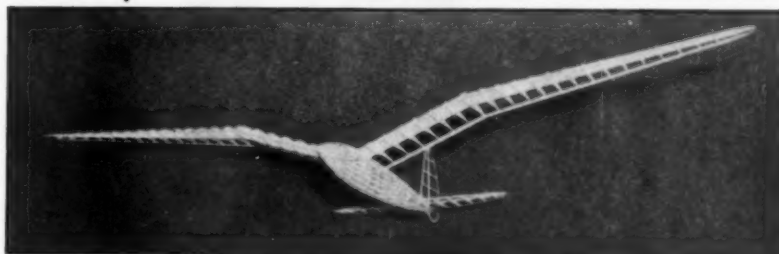
Pict. No. 7. A perfect Bristol Fighter by Norman McKinley

Original Design Contest Results

Pictures No. 3 and No. 4 show the model of Roger F. Parkhill of the Air Corps Technical School, Lowry Field, Denver, Colorado, which won the Original Design Contest this month. A number of tailless monoplanes have been designed and presented; however, here we have a tailless biplane. Actually, the lower wing is set in such a position that its effect is that of a tail. Such reaction is caused in biplane types by setting the lower wing at an angle more negative than the upper wing, and staggering the combination of the two wings. That is, placing the lower wing considerably to the rear of the upper wing. When this is done the ship is termed a tailless biplane with a stagger-decalage; the term "decalage" referring to the difference in angle of incidence of the upper and lower wing. You will note that the fins and rudders are placed on the lower wing, which is in effect the tail. The arrangement is extremely clever. Such a design would readily lend itself to an efficient fighter, inasmuch as the lack of any tail allows the rear gunner to have a full sweep of fire with his machine gun. At present the only full size craft which is similar to this is an English tailless monoplane fighter.

Another feature of this model is the arrangement of the landing gear. There is but a single wheel; the rear of the plane being supported, and the wheel especially, by the two fins. Such an arrangement decreases head resistance and therefore increases the speed.

The model is twenty inches in span and has the unique type of structure which allows the angle of incidence and the position of each wing to be changed at the will of the flier. In this manner the exact adjustment for correct flight may be made. Mr. Parkhill says the model flies consist-



Pict. No. 11. A beautifully designed and built gull-wing soarer, by LeRoy Erickson

Pict. No. 10. This is getting 'em down pretty small. V. Leskowsky's 11½ inch Gee-Bee Racer beside a pack of cigarettes



ently; its ability to fly in a straight line being a notable characteristic. Congratulations, Mr. Parkhill; you win the \$5 award this month!

Picture No. 4 will give a good idea of the structure of the plane to anyone who may wish to build and fly a ship of this type.

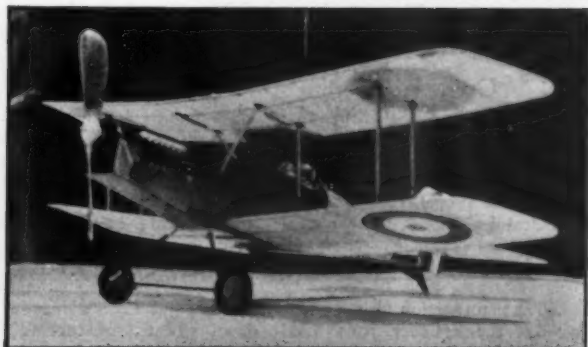
Perhaps a number of our readers saw the movie "Men With Wings" and those in the vicinity of New York City saw a very interesting exhibit of all types of early and modern ships which was on display in the lounge of the New York Paramount Theatre. Nearly every type of plane was represented, from the early Wright model to our present-day transports and fighters. One of our well-known model builders, Jesse

(Continued on page 59)

Pict. No. 9. (Right) Clifford McBaine has flown his Grant Wakefield for more than 2 min.

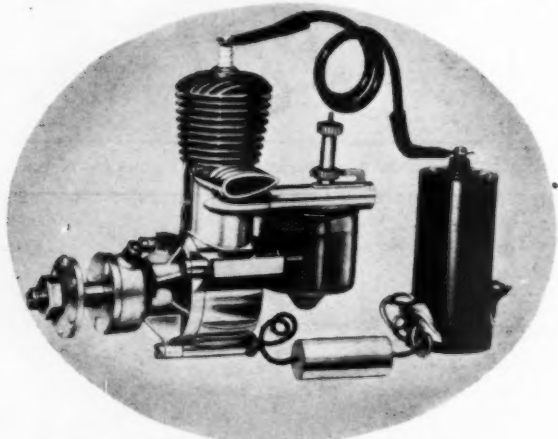


Pict. No. 12. Some of Oskar Eklof's 39 models in his hangar



G. Cudmore's prize winning SE-5 scale model

LEADING THE FIELD FOR '39!



the Ohlsson "23"

Ask your dealer for a demonstration of this sensational record-breaking motor which is taking model airplane fans by storm. It costs only \$16.50 and it's meeting with the greatest reception ever ac-

corded a miniature airplane motor. Write today for new 2-color, illustrated booklet giving complete description and specifications of both the Ohlsson "23" and Ohlsson "Gold Seal."

(OHLSSON)
MINIATURES

630 NORTH ALVARADO STREET
LOS ANGELES, CALIFORNIA

"Whirlwinds" In Miniature

(Continued from page 17)

chamber. Additional cooling is provided by two spark plug coolers which are inserted in the cylinder heads.

The side exhaust system is another feature of the Whirlwinds, which permits the use of either a front or rear exhaust system. The exhaust ports are provided with detachable finned elbows for the use of the standard front exhaust system (collector ring). Another type of elbows are available for the rear exhaust system.

Rocker support boxes are cast integral with the cylinder head and are provided with a cover, which are held in place by springs or clamps. The springs or clamps are easily removable for inspection of the valve mechanism. The cover forms a rigid support for the anti-drag ring, eliminating the use of brackets.

Crankcase

The crankcase consist of five major castings of high tensile aluminum alloy. The sections are:

1. The nose section (Fig. No. 12), which supports the propeller thrust bearings and is conical in shape.
2. The intermediate section (Fig. No. 13), which supports the front main bearings.
3. The main section (Fig. No. 14), which provides the cylinder pads, holds down studs and support for the crankshaft. Also, the cams and cam-follower are housed at the rear of this section.
4. The supercharger section (Fig. No.

15) has a diaphragm that carries the impeller and its drive. The diffuser and distributor is located in this section and in section Fig. No. 16A.

5. The rear section (Fig. No. 16) houses the accessory drives and supports the various accessories such as magnetos, generator, starter and various connections. The mounting lugs are also in this section.

Exhaust Manifold

The front exhaust collector ring, which scavenges the exhaust gases, is standard equipment. Rear exhaust can be made into small stacks or a collector ring system; they are to be determined by the design of the engine cowl and airplane before the system is decided upon.

The cowl and manifold support is a formed aluminum plate, fitted between the exhaust manifold and the crankcase front section. They are rigidly attached by riveted plates at the fastening points and are provided with cowl fasteners at its outer circumference. The front of the cowl is open and no shutters are used. There is an opening at the lower part of the cowl to connect with the carburetor preheater (commonly called carburetor heater) and air cleaner.

Carburetor Air Preheater and Cleaner

The combination carburetor air preheater and cleaner insures a supply of a clean, heated mixture to the carburetor; and it prevents ice formation in the carburetor during cold operation. Controls are provided to permit the regulation of the amount of preheat in different climatic conditions.

Specifications of "Whirlwind" models

	165 H.P.	240 H.P.	300 H.P.	420 H.P.
No. of Cylinders	5	7	9	9
H.P. at R.P.M.	2,000	2,000	2,000	2,150
Bore	5"	5"	5"	5"
Stroke	5-1/2"	5-1/2"	5-1/2"	5-1/2"
Length	40-11/16"	40-5/32"	43-7/16"	43-7/16"
Max. Eng. Dia.	45"	45"	45"	45"

Building the "Whirlwind" Model

When building a model motor for a model airplane of a known scale, use the same scale on the motor as you used on the airplane.

The first piece to make is Fig. No. 14. Use your scale and, besides referring to Fig. No. 14, refer to Figs. No. 7 and No. 8 to determine the width, length and thickness of this section. Secure a block of wood that will be about an inch over these dimensions, except for the thickness. Plane both sides (front and rear sides) down to the exact thickness, making sure that the whole side is parallel to the other side. On both the rear and front sides, lay out the horizontal and vertical center-lines—be sure that the two centers are in exact linage. Refer to Fig. No. 7 and draw the scaled circle "LX" on both sides from the engine centers. Draw a much larger circle from the same centers and divide this circle into nine equal segments. At each division, place a point, which totals nine in all. Do this on both sides. Draw nine lines from the center that will pass through the points on the large circle. Do the same on the other side. At the points where the cylinder center-lines meet the circle "LX," draw nine lines that will be at right angles (90 degrees) to the cylinders' center-lines that will pass through the points on the circle "LX." Use the same operation on the other side but make sure that the angles will be parallel to the other sides. Now cut away the surplus to your best judgment. When complete, check each angle for perfect squareness to all sides. Draw the cylinders' side center-line around the block; drawing the lines that will join the front and rear center-lines and that will pass through the side center-lines. Mark each exact cylinder mounting center with a distinctive point. Hollow out the center and when finished drill the dowel holes, if you are going to use the same system as explained in the Wright "F-50" directions.

Now proceed to Fig. No. 13 and make the first shape the best that you know how. When it is all shaped, finish it off with the offset circles. Attach the section to Fig. No. 14 and smooth all the nine sides evenly.

If you wish, you can turn Fig. No. 12 on the lathe and finish it off like the assembly drawings show (Fig. No. 1 and No. 2). Fig. No. 15 can also be turned on the lathe. It is best to drill the push-rods' holes as shown on the plan, for when assembling the rods will be less apt to get out of line.

Now proceed to Fig. No. 16A, which is rather a difficult job. It's best to make a template first and, after it is completed, figure out your best way to make the section. If you can carve it out of one single block, do it. If you can make a better job by building it up, then do it this way. When the job is completed, make the rear section and attach both pieces together. On Fig. No. 16A, round all corners and also the

same corners where the rear section is attached to Fig. 16A. Also by referring to the photographs, you can get a good idea of the curves and requirements.

If the nose section is completed, detailed according to the assembly drawings, then make the cylinders as shown in the Wright "F-50" directions. Attach the cylinders to the block and at the same time make sure that the pushrods are attached in exact linage. Add the wire harness (Fig. No. 17) with its accessories. . . later add the baffles and all rear gadgets. Paint it now, and, when the paint is dry, add the metal fixtures. MODEL AIRPLANE NEWS would like to see pictures of the completed model motor as well as the "F-50" Cyclone and the "III-C" Hawk.

A High Performance Puss Moth

(Continued from page 23)

should not be cemented to the fuselage until the covering is completed. The size of the wing struts is shown on Plate No. 3. They are cemented only to the wing; (after covering) the other ends having wire hooks. A small rubber band runs from one hook to the other, holding the struts in place, and making it possible to remove the wing.

Propeller

Carve the propeller from balsa block 1-1/8" x 1-1/2" x 8". A very efficient blade shape is shown on Plate No. 2.

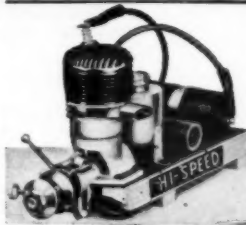
Covering and Assembly

Tissue cement or nitrate dope is applied with a small brush, and the excess paper is cut off with a razor. After the frames are covered, the wing and fuselage may be sprayed with water. Dope the body with two coats of nitrate dope, but use only one thin coat on the wing and stabilizer, to prevent warpage. Cover windows with celluloid, using nitrate dope for adhesive. Cement landing gear struts to fuselage. Soda straws 1/4" long, which represent exhaust pipes, are cemented to the nose. The stabilizer and rudder are then cemented in place. The motor cover is made of bond paper and cemented on three sides front, top and bottom, leaving back open 3/16". This opening represents an outlet for air, which cools the engine on the real ship. Strips of black paper 1/16" wide are cemented to the window frames, door and motor cover. Paint the fuselage and wings with black dope; the bottom of the fuselage being painted from nose to tail. Letters are made of black tissue or thin black paper and applied with nitrate dope. The wings are held to the fuselage with a loop of 1/8" flat rubber.

Flying

Power your model with twelve strands of 1/8" flat rubber. Balance the model by holding it at wing tips, at a point one-third back from the leading edge. First glide model, and, if it dives, move the wing forward or put a small block under the front of the wing, giving the wing incidence. If it stalls move the wing back, or remove some of the incidence. Then you are ready for powered flights.

SCIENTIFIC Says: THESE ARE DEPENDABLE ENGINES AT DEPENDABLE PRICES



HI-SPEED ENGINE
1/7 H.P.—4,500 R.P.M.
Bore 3/16" oz.
ONLY \$12.75 Postpaid
including Propeller

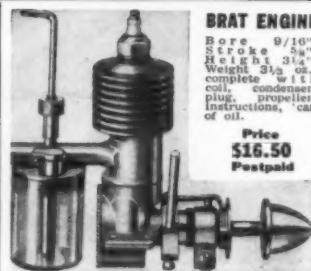
OHLSSON
Model "23"
Horsepower 1/7;
Stroke 3/16"; Bore 3/16";
Bare engine weight only
4 1/2 ounces;
Height 3-9/16".
Complete with
coil, condenser,
etc.

\$16.50
Postpaid



TROJAN JR.
Bore 5/8", Stroke 5/8".
Horsepower 1/4.
Flying wt. 9 ounces including
batteries, fuel,
propeller, etc.
This is the new 1939
Model with enclosed
timer and dual exhaust
ports. Complete with
coil, condenser, oil,
propeller and
double
guarantee
\$18.50
Postpaid

DEALERS INVITED TO BUY FROM US. WRITE IN ON YOUR LETTERHEAD FOR SPECIAL DISCOUNT LIST ON GAS ENGINES. WE STOCK THEM ALL AND CAN GIVE PROMPT DELIVERY.



BRAT ENGINE
Bore 9/16",
Stroke 3/16",
Height 3 1/2",
Weight 3 1/2 oz.,
complete with
coil, condenser,
plug, propeller,
instructions, "can
of oil."

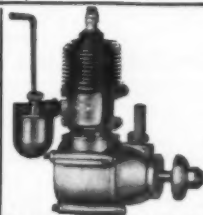
Price
\$16.50
Postpaid



Forster Bros.

Bore 1-1/16",
stroke 1 1/4", 1/2
H.P., 2 piston
rings, bare weight
14 ounces.
Model "B", Air
cooled, with
bronze main bearing
.....\$17.75

Same as above
but with Precision
Aircraft
Ball Bearing Main
Bearing.....\$19.90
Model C Air or
Water Cooled.
Not including
Fly-wheel, with
Propeller Bearing
.....\$17.75
The same with
Ball Bearing
.....\$19.90



**SYNCRO
ACE
SPECIAL**

ONLY
\$9.95
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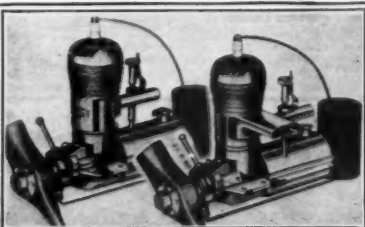
Horsepower—1/2; Bore, 3/8";
Stroke, 15/16"; Speed up to
10,000 R.P.M. Complete with
coil, condenser, oil, tru-pitch
propeller and double guarantee.



Syncro Ace, Model "A."
A high quality precision
engine, \$13.75 complete,
postpaid.

M & M MOTOR

Ht. 3 3/4"; 21/32" Bore;
1/8" H.P.—Approx. 4 oz.
\$17.50 Postpaid



1939 BUNCH MOTORS

WORLD'S LOWEST PRICED ENGINE

MIGHTY MIDGET Only \$7.45 ASSEMBLED ONLY \$9.50
Complete KIT TO RUN Postpaid

Specifications: All Bunch Engines full 1/2 h.p. \$200 r.p.m.; 1/4 h.p. \$500 r.p.m. Bore 7/8", Stroke 1 1/8". Bare Weight 8 1/2 oz. Complete, ready to run, with coil, condenser, fuel tank and Champion spark plug.
MIGHTY-MIDGET Upright Assembled.....\$ 9.50
MIGHTY-MIDGET Upright Kit.....7.45
MIGHTY-MIDGET Inverted Assembled.....9.75
MIGHTY-MIDGET Inverted Kit.....7.65
GWIN-AERO Upright Assembled.....12.00
GWIN-AERO Upright Kit.....9.95
GWIN-AERO Inverted Assembled.....12.50
GWIN-AERO Inverted Kit.....9.85
MIGHTY MARINE Assembled.....12.50
MIGHTY MARINE Kit.....10.45

All prices are postpaid
FREE correct design propeller, S.A.E. 70 oil, and instruction manual and Scientific Double Guarantee.

BANTAM

Specifications:
Bore 19/32",
Stroke 19/32",
Bare engine weight 2 1/2 oz.
Speed range—500 to
10,000 R.P.M.
Gas tank removable
for cleaning.
Capacity 3/4 oz.
Semi-enclosed and
adjustable timer.
Spark Plug—1/4 x
3/2 V 2 Champion.



\$16.50
Postpaid

BROWN Jr. MODEL D ENGINE

POSTPAID

1 1/2" Bore, Ht. 4 1/4",
1 1/2" Stroke, 1 1/2 H.P.,
1200 to 10,000
R.P.M.

Weight, ready to
run with gas, two
batteries & propeller
20 1/2 oz.
In less than four
months close to
10,000 of these
Brown Jr. engines
have been sold!
Complete with coil,
condenser, instructions
and double
guarantee. Only
\$10.00 Postpaid.



MODEL "B"

Long famous for
power, smooth
running, and high
compression. Piston
ground and lapped
to perfect fit. Highest quality
gas engine
obtainable.

\$21.50
Postpaid



BROWN Jr. "M"
Marine
Complete
\$15.00
Postpaid



**HUSKY
JUNIOR**

3/8" bore,
1 1/2" stroke,
complete weight 6 1/2
oz. Complete with
coil, propeller,
oil and double guarantee,
postpaid

\$12.50

SCIENTIFIC MODEL AIRPLANE COMPANY

"GAS MODEL HEADQUARTERS"

218-220 MA-3 MARKET STREET

In France: E. Kruger & Co., In England: Model Supply
8 Rue St. Sebastien, Paris Stores, 4 Stewart St., Deans-
gate, Manchester

In Australia: Swift Model
Aircraft, 158 Adelaide St.,
Brisbane, Queensland

NEWARK, N. J.

In Finland: O.V. Wilkman
A/B, Turku, Abo

NEW SCIENTIFIC "COMMODORE" TAKES THE COUNTRY BY STORM!



Wingspan.....6 feet
Overall length.....50"
Wing Area.....5.2 sq. ft.
Total weight with motor and
ignition mounts.....3 1/2 lbs.
Airfoil section, Gottingen 549
Glide Ratio.....16 to 1
Rate of Climb.....Approx. 700
ft. per min.

Complete \$6.95
Less
Wheels

PRICES ARE POSTPAID

Complete \$7.95
Including
Pneumatic
Wheels

SEE YOUR DEALER

COMMODORE DeLuxe Gas Model

THE SUPREME ACHIEVEMENT IN GAS MODEL DESIGN

The new Scientific Commodore gas model has been designed by the well known "Eaglet" gas model designer, Mr. Ben Shreshaw. In this new model Mr. Shreshaw has combined all his knowledge and efforts to build what we believe the finest gas model in America.

Any inexpensive 1/2 horsepower engine may be used. On many test flights the "Commodore" was powered very successfully with the Brown Jr. Model D engine. Other engines such as the Brown "B", Chilson, Midget Guin, Denymite, Synerco, or any other reliable make motor may be used with success.

Kit is 100% COMPLETE, including highest quality sheet and strip balsa, finest spring steel wire, all metal fittings, ignition wire, large full size plans with explicit instructions, all necessary liquids, etc., etc.

MISS AMERICA GAS MODEL

NOW HOLDS
WORLD'S RECORD
WITH FLIGHT OF
46 MINUTES ON
27 SECOND MOTOR
RUN.

Word has just been
received from
N.A.A. headquar-
ters at Washington
confirming this
flight made by Mr.
Phoenix of Houston,
Texas.

Kit is 100% com-
plete with 3 1/2" Pneu-
matic wheels, 7 ft.
wing; wt. (less motor)
2 1/2 lbs. 22 min. on one
oz. fuel; 18 to 1 Glide.

\$7.50
P.P.

BREAKS WORLD'S RECORD!



THE STREAMLINER

Wingspan 6 Ft. Length 43"

Weight (less motor) 2 1/2 lbs.

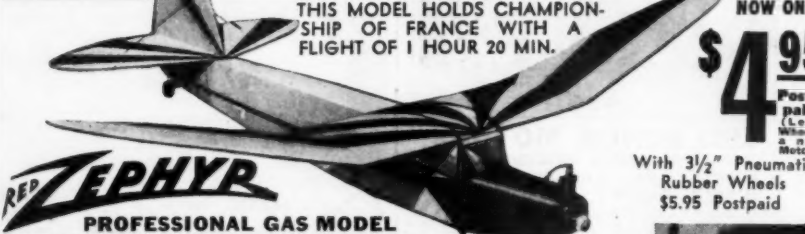
Has detachable wing, adjustable rudder control, and stamped nose cowling which completely hides engine—with hinged hatch for accessibility.

COMPLETE KIT with Ready-made balsa ribs, Stamped Metal nose cowling, liquids, all balsa cut to correct sizes, nuts, bolts, electrical connections, celluloid, rubber, bamboo paper, large full size detailed plans giving every bit of information needed for building and flying the "Streamliner."

Complete kit, less wheels, at your dealer or direct, only.....\$4.95

Complete kit, including a pair of 3 1/2" pneumatic rubber air wheels, only.....\$5.95

Postpaid



RED ZEPHYR PROFESSIONAL GAS MODEL



7 Red Zephyrs entered at National by Iowa Model Club

THIS MODEL HOLDS CHAMPION-
SHIP OF FRANCE WITH A
FLIGHT OF 1 HOUR 20 MIN.

NOW ONLY

\$4.95
Post-
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With 3 1/2" Pneumatic
Rubber Wheels
\$5.95 Postpaid

NEW! SELF-STARTER

Cranks your model engine for you. No booster bat-
teries needed. Simple,
positive, safe! Press the
button and your motor
runs.

THE BIGGEST
KIT VALUE
EVER OFFERED

\$3.00 Postpaid

The EAGLET — A POPULAR SMALL GAS MODEL

44" Wing—Length 32"

Flying Weight 17 ozs.

Truly the Finest Midget gas Job Offered to the Gas Model Builder Today.

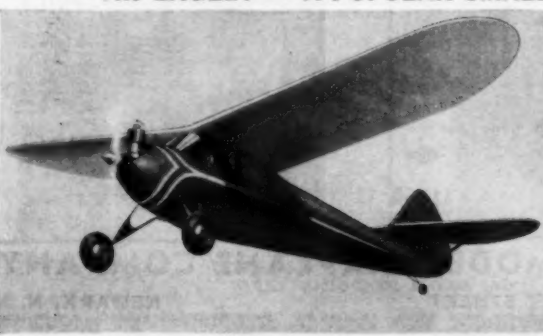
DESIGNED FOR USE WITH MIDGET GAS ENGINES

The trend in the size of gas models today is toward a ship of about three to four feet wingspan, and correspond-
ing light weight.

The "Eaglet" won 2nd and 3rd places at re-
cent Philadelphia gas
meet.

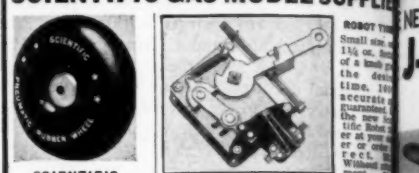
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POST-
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"GO SCIENTIFIC" Best Money Rubber-Powered

SCIENTIFIC GAS MODEL SUPPLIES



SCIENTIFIC WHEELS

Absolutely punctureproof—leakproof. Per Pair \$1.50 P.P.

WORLD'S FINEST QUALITY FINISHES



Clear Dope, Colored Dope, Thinner, Cement, Heavy Cement, Bamboo Cement, Banana Oil, 3 oz. bot. \$.25, 1/4 pt. can. \$.50, 1 pt. can. \$.75, 1 qt. can. \$ 1.40

PROP. SPINNER.....30

BALSA WOOD 8 Ft. Lengths

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Sheet Balsa

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Sheet Balsa

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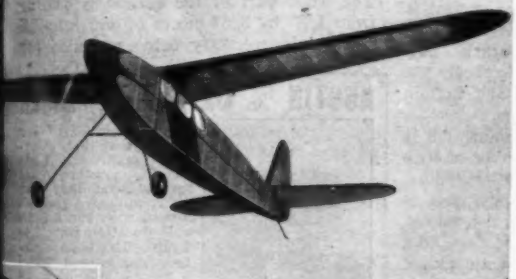
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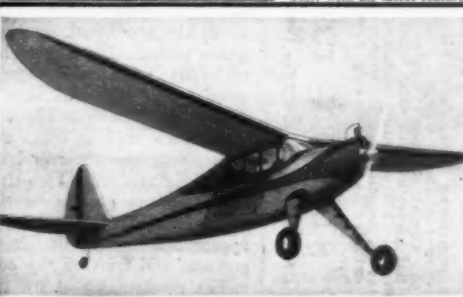


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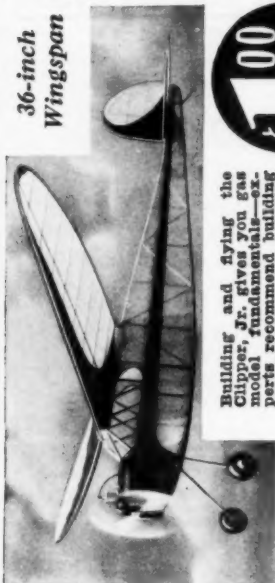
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36-inch
Wingspan

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Building the Midget Speedster

(Continued from page 7)

ground. Correction for climb or dive is made by warping the elevators slightly. Torque can be cured thus: Looking at the model from the rear, warp the trailing edge of the left elevator down slightly and the right elevator up slightly. This is more effective than rudder adjustments as the model tends to roll rather than turn from the torque.

After adjusting, try a few snappy take-offs, winder wound. Then watch the air hum.

A Three Wheeling Gas Model

(Continued from page 11)

assembling be sure that the bottom of the ribs is flush with the bottom of the spars. Note also that in the lower front corner of the front spar and the lower rear corner of the rear spar a shallow groove 1/8" by 1/32" is cut and extends the full length of the spars. The leading edge is 1/2" wide and is put on now. It has the same shallow groove cut into it to receive the 1/32" sheet balsa which covers the bottom of the wing between the leading edge and the front spar, and the rear spar and the trailing edge. However, do not put this on until the strut fittings have been built in. Drill two holes in rib (28) where shown and cut four lengths of 1/4" O.D. aluminum tubing. Tin these with aluminum solder. The straps are brass sheet 1/2" by 1-3/4" and after the insides are tinned, bend and solder these to the tubing. These in turn, are bolted to rib (28) with 2-56 roundhead machine screws. To take this size screw, drill a 3/32" hole. Put these ribs on the wing and glue on the trailing edges and the tip outlines. Note that the rear bottom surface is covered diagonally. One-sixty-fourth inch flat strips are glued over the cracks. Although this is not necessary, it improves the appearance. Cover the front and bottom surfaces and trim off the outlines.

The construction of the trimming tab is quite clearly shown. The same type of strip hinges are used as were used on the rudder.

To streamline the strut fittings, glue to both sides and the bottom of the tubing, 1/8" thick pieces of balsa. Sand these to a streamline shape and finish with plastic wood. Plug the rear fitting so that the shear pins will not come out. Drill two small holes vertically through the butt ribs and tubing to take wire staples which keep the wing panels from separating. Check the wing for any weak joints.

In making the fuselage, follow the conventional method of construction by first laying out the longerons, uprights and diagonals of one side on a pattern. The only stations which have no uprights are stations (8) and (10). No upper crosspieces are used at stations (5) and (10). A crosspiece is necessary at the lower end of former (6a). The uprights and crosspieces at station (6) are 3/16" by 1-1/4" white pine. All the longerons, crosspieces, uprights and diagonals in front of station (6) are 3/16" square white pine. All crosspieces, diagonals and uprights to the rear of station (6) are of 3/16" square hard balsa. While the sides are drying make the firewall, bulkheads and formers. The firewall

is 1/4" thick aircraft plywood. The formers at station (4) are 1/4" thick and should be cut out for lightness. Medium balsa may be used. The bulkhead at station (5) is made of 1/4" thick hard balsa. A vertical slot is cut out as shown to receive the fuselage sides. At station (6) the bulkhead is 1/4" thick aircraft plywood. The remaining formers are all cut out of 1/8" thick, flat, hard balsa. Make sure that all holes necessary for ignition wires, landing gear, etcetera are cut or drilled in as required.

Assemble the fuselage by slipping the sides into the slots in bulkhead (5) and the square holes cut in the firewall for the longerons. Next, put in bulkhead (6) and glue securely; using 1/2" brads for extra strength. Put in all the rest of the crosspieces and the lower rudder post, which is 1/4" thick hard balsa. Use 1/2" brads at all corners.

The top of the fuselage between stations (7) and (9) is covered with 1/32" hard sheet balsa and between (9) and (10) two 1/8" flat pieces of balsa form the sides of the fuselage on which the tail surfaces rest. The area between these and just to the rear of station (9) is filled in with scraps of balsa. At this time the tail block can be glued on and sanded down to conform to the shape of the fuselage. Cut away the top of the fuselage sides between stations (9) and (10) to allow for some movement of the stabilizer. The high point must be immediately beneath the spar of the stabilizer and serves as a pivot point or fulcrum.

Leave this portion of the fuselage temporarily and return to the front part. The hardwood piece between the firewall and station (5) is 1/4" thick and tapers in side view from 3/4" to 1/4". Glue it in securely. The dashboard is made from 1/8" flat balsa. The wood part of the cockpit is built up from 1/8" by 3/8" pieces of soft balsa. A stringer is necessary between station (4)

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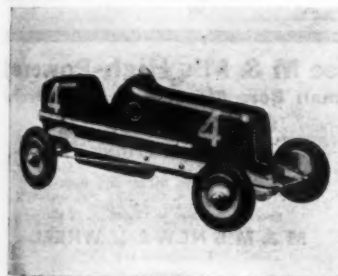
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and former (6a) to keep the stiff paper cowling from sagging. There are also five similar stringers between the firewall and station (5). These are all 3/32" square. The booster plugs are mounted on a piece 1/8" by 1/2" on the right side in the position shown in the plans.

The battery slide and runner come next. The slide, to which the batteries are cemented, is 1/8" by 1-3/4" by 2-1/2" and slides in a runner, the overall width of which is two inches. The runner is made by gluing two 1/8" square strips to the base. On these are glued two strips 1/4" by 1/8". The runner fits snugly against bulkhead (5) and goes as far back as station (7). This provides ample room for fixing the center of gravity.

The landing gear is made of .094 piano wire and sheet brass. To make the rear landing gear make four pieces which constitute the main members. The true length and shape of these is shown in the front view. Solder these first to the upper fittings which are 1" by 1-5/8" sheet brass. The lower piece is bent as shown from a piece 1" by 3-1/4". Solder this well to the piano-wire legs and drill a 1/8" hole where shown. An auxiliary piece in the shape of an elongated "S" is soldered between these legs. Both sides are connected by two pieces of piano wire which, when the landing gear is put on the plane, fit up against the bottom of the fuselage. All joints are bound with tinned wire and soldered well. Drill two holes through each of the upper landing gear ends with a No. 33 drill and bolt to the uprights at station (6) with 4-40 roundhead machine screws. Coat this well with cement. The axle is of 1/8" O.D. brass tubing and long enough to extend about a sixteenth of an inch or so outside of the wheel hub. Solder this to the lower fitting. Drill the outer end with a No. (50) drill and tap 2-56 N.C.-3 by 3/8". The wheel is held on with a washer and 2-56 screw.

When making the front landing gear leg, make the U-piece first. To this, solder the trapezoid-shaped ends which hold the axle bearings. The other members can now be soldered on, as well as the upper fitting which it cut and bent from a blank of sheet brass 1-3/8" by 1-7/8". Six 3/32" holes are drilled in this fitting and four 2-56 screws are used to bolt the leg to the bulkhead and the tapered piece already described. The bearings are two pieces of 1/8" I.D. copper tubing, 3/8" long. The axle is a length of 1/8" O.D. brass tubing, both ends of which are drilled and tapped the same as the axles of the rear landing legs. Take pains in lining up this and roll the fuselage across the floor several times to check the alignment of the wheels. This is important if you don't want the plane to ground-loop.

The fillets or streamlines for the rear landing gear legs are carved from medium balsa. The side and top view are shown on the graph to give you exact dimensions. Before putting on the streamlines it is necessary to cut notches on the inner sides where they fit over the landing gear legs. After they are on the plane, glue these pieces back in and fill the resulting hole with plastic wood to strengthen this part of the landing gear. Sand them carefully, being sure not to get them undersize.

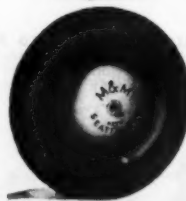
We are ready now to install the wing struts, which are basswood, 1/2" by 1/4". The front ones are ten inches long; the rear ones must be cut to fit when the angle of incidence is built in. Locate the place on the longerons where the struts intersect them and nail them at this point and at their lower ends with 1/2" brads. Glue securely. To make the struts more rigid, the space between the firewall and station (5) and between the longerons is filled in with 3/16" thick white pine or hard balsa. Cut two pieces of 1/4" O.D. aluminum tubing and tin the ends. Four straps are made of sheet brass just as they were for the wing fittings. Bolt these on with 2-56 screws. Bolt the front ends first and check the dimension between the tubes. This should be about 1/16" shorter than the distance between the tubes on the wing so that when the wing is put on, you have a snug fit. Determine the angle of incidence and cut the rear struts to the correct length. After this has been done, make four 3/32" welding rod braces. The lower ends of these are flattened, drilled and screwed to the white pine pieces between the longerons. The upper ends are soldered to the straps. Go over all joints well with cement. Streamline the exterior parts of the struts as shown, with soft balsa, using plastic wood to fill in the cracks.

The "juice" is furnished by four penlight batteries which, in pairs, are connected as shown. Wrap a piece of adhesive tape around them and cement firmly to the slide. The toggle switch is mounted on a seat 3/16" by 1" which is glued between the longerons just before station (7). Put in your ignition wires, making sure that all connections are soldered well.

The 1/2" by 1/2" by 5-1/8" dural angles are bolted to the firewall with three 4-40 screws in each. Note that where the lower screw is shown a slot is cut in the angle.

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The foregoing gives you an idea of only some of the things that are available for gas model builders and even at that we have only scratched the field on a few of the major items that are listed to say nothing of the hundreds and hundreds of small parts such as all types of aluminum tubes sizes from 3/64" I.D. up all kinds and sizes from 1/32" upwards in many cases on round, square, hexagon in aluminum, brass, cold roll steel. Fibre in sheets and rods to say nothing of a wide variety of all types of sheet aluminum, brass, aluminum paper backed, aluminum and brass angles, and rivets, music wire from .010" to 1/4" diameter, eutecticon pins, model-making pins, all kinds of electrical apparatus, other motors and models that will be of interest too.

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In a crack-up, this allows the mount to swing upward, and thus may save the trouble of making a new motor mount.

At this stage in the construction, we are ready to put on part of the stiff paper cowl. This paper is the type commonly used in filing cabinets for folders. Use paper cement which can be obtained at any stationers; do not use gas model cement as it will cause the paper to wrinkle. Beginning with that portion between the struts, cover all the fuselage on the top from the firewall to the dashboard. On the sides, cover from the firewall to station (6). The area between station (6) and former (6a) is not covered until the silk has been put on the rear portion of the fuselage. It is a good idea to leave the section adjacent to the booster plugs open until you have checked the ignition. The bottom is covered from the firewall to the crosspiece at former (6a).

The rear part of the fuselage is finished now by putting on the 3/32" square stringers and 1/8" square transverse diagonals.

The shaft and sleeve parts of the stabilizer adjustment mechanism are assembled on crosspieces 1" by 3/16" white pine. The sleeves are two pieces of brass tubing 1/8" O.D. by 5/8", to which are soldered the washers. These are at angle to coincide with the slant of the longerons. The lower washers are soldered on after the sleeves have been inserted in the crosspieces. The shafts are 3/32" O.D. rod by approximately 4-1/4" long for the front one and 3-3/4" for the rear. All other information is given on the plans. When finished cement and nail in the assembly with 1/2" brads.

The lower wire fittings are not put on until after the fuselage has been covered; four 3/8" wood screws are used to fasten them to the longerons.

Most of the information necessary to make the cockpit cover is conveyed in the plans. A bamboo framework is cemented on and inside this a cut-out section of paper is glued. The celluloid is cemented to this. Use thin celluloid and you will have no trouble.

The fairings on the landing gear are much simpler than they seem. They are also made of stiff paper. A strip of paper 1/4" wide is used to hold the edges together; paper cement being used throughout. The front fairing is simply held on by the screws which keep the front axle from sliding out. The rear ones are made by fitting the paper around the streamline and leg before the final cementing. Around the outer edge of the streamline cut a 1/32" by 1/4" groove and slip the fairing over the leg. Cement it to the streamline. In landings the fairing will buckle and wrinkle a little, but not enough to seriously injure the appearance of the plane.

The engine mount is made entirely of aircraft plywood. The sides are 1/8" thick and the formers and centerpiece are all 1/4" thick. Cut all the parts accurately, and do not forget a hole for the coil which is fastened with a clip to the firewall. Assemble all the parts with brads, glue and give them a couple coats of dope.

Install the coil, condenser and gas tank where indicated. You may use any engine with the conventional mounting lugs. Since every make of engine varies a little in dimensions, we have shown where the rear face of the propeller must be. Drill your holes in the proper places and line up your engine carefully. There is no off-set or change in the thrust angle necessary.

The engine cowl is made in two parts: The cowl which fits over the engine proper and the skirt. The skirt is a framework consisting of two 1/8" plywood formers and four 1/8" by 1/4" stringers. The rear former has four holes cut in it to receive the four triangular blocks of pine which are glued and screwed to the firewall. On the inside of the cowl and just in front of the rear former, four tabs 1/8" by 1/2" by 3/4" are glued. The 3/8" wood screws which hold the skirt pass through these into the blocks. The framework is also covered with stiff paper. The front cowl is made of medium balsa blocks which are glued together with the grain running as shown. You can make this right on the skirt, cutting it off when finished. This cowl fastens to the skirt in the same way that the skirt fastens to the firewall, except that only three blocks are necessary. Cut out the cooling holes and exhaust hole.

Covering and assembling the model is your next step. Use silk on the wing, tail surfaces and fuselage. Two coats of dope will be necessary to tighten it.

The color scheme and design is a matter of choice and personal preference. We used two coats of green and white brushing lacquer which served very well. Before painting, give all paper and wood surfaces a coat of dope.

Assemble the wing panels and put them on the fuselage. Remember that these must fit accurately and tightly together. The fin and rudder can now be attached to the stabilizer by cementing them on firmly. Put the tail surfaces on the fuselage and with the stabilizer set at zero degrees rig the tail. Use 1/2" turnbuckles and do not forget to wire them so that they will not vibrate loose. To change the angle of incidence, simply loosen the turnbuckles and turn the shafts until you have the desired angle. The plane flies best at a

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18" PLANKS
1x1 5c; 1x2 6c
1x1 1/2 5c; 1x2 10c
1x3 15c; 2x2 18c
2x3 23c; 2x5 30c
3x3 40c; 3x5 75c

BAMBOO
1/16sq. x12, 36, 5c
1/16sq. x15, 42, 10c

CLEAR DOPE OR THINNER
5c per oz.; Large bottle, 8c; 1/2 pt. 50c; 1 pt. 45c

COLOR DOPE
6c per oz.; Large bottle 10c.

CLEARCERMENT
5c per oz.; Large bottle, 8c; 1/2 pt. 50c; 1 pt. 55c

PROPELLERS
Mash. Paul-O-Mash. Cut Wina
5" 4c
6" 5c
7" 6c
8" 7c
9" 8c
10" 9c
12" 10c
14" 14c
15" 15c

RUBBER
045 25 ft. 5c
1/16 sq. 15 ft. 5c
1/2 Bat 15 ft. 5c
Skin 50c
3/16 10 ft. 5c

RUBBER LUBRICANT
Large bottle 10c

BAMBOO PAPER
White 2 for 15c
Red or yellow 10c ea.

NOSE BLOCKS
1x2x1 1c
2x2x1 2c
2x3x1 3c
3x3x1 5c
3x3x3 10c

CAMEL'S HAIR BRUSHES
Small 3c; Large 5c
Extra large 8c

THRUST BEARINGS, dz.
Sm. 10c; Lge. 15c

PROP BLOCKS
1/2x1/2 6-5c
1/2x1/2 3-5c
1/2x1/2 3c ea.
1x1 1/2 12 4c ea.
1x1 1/2 12 7c ea.

SANDPAPER
Dox. sheets 5c

WIRE
6-8-10-12-14 2 ft.
1/16 dia. 5 ft. 12c
3/32 dia. 5 ft. 15c
1/2 dia. 5 ft. 25c

PROP. SHAFTS
1/16 dia. 5 ft. 12c

REAR HOOKS
Dox. 8c

TISSUE, AA
All col., doz. 10c
Silver 5c
Superfine, wh. 5c

ALUM. TUBING
1/16. 3/32. 1/4. 1/2. 3/8. 1/2. 3/4. 1. 1 1/2. 2. 3. 4. 5. 6. 8. 10. 12. 14. 16. 18. 20. 24. 30. 36. 48. 60. 72. 84. 96. 108. 120. 144. 168. 192. 216. 240. 264. 288. 312. 336. 360. 384. 408. 432. 456. 480. 504. 528. 552. 576. 600. 624. 648. 672. 696. 720. 744. 768. 792. 816. 840. 864. 888. 912. 936. 960. 984. 1008. 1032. 1056. 1080. 1104. 1128. 1152. 1176. 1200. 1224. 1248. 1272. 1296. 1320. 1344. 1368. 1392. 1416. 1440. 1464. 1488. 1512. 1536. 1560. 1584. 1608. 1632. 1656. 1680. 1704. 1728. 1752. 1776. 1800. 1824. 1848. 1872. 1896. 1920. 1944. 1968. 1992. 2016. 2040. 2064. 2088. 2112. 2136. 2160. 2184. 2208. 2232. 2256. 2280. 2304. 2328. 2352. 2376. 2400. 2424. 2448. 2472. 2496. 2520. 2544. 2568. 2592. 2616. 2640. 2664. 2688. 2712. 2736. 2760. 2784. 2808. 2832. 2856. 2880. 2904. 2928. 2952. 2976. 3000. 3024. 3048. 3072. 3096. 3120. 3144. 3168. 3192. 3216. 3240. 3264. 3288. 3312. 3336. 3360. 3384. 3408. 3432. 3456. 3480. 3504. 3528. 3552. 3576. 3600. 3624. 3648. 3672. 3696. 3720. 3744. 3768. 3792. 3816. 3840. 3864. 3888. 3912. 3936. 3960. 3984. 4008. 4032. 4056. 4080. 4104. 4128. 4152. 4176. 4200. 4224. 4248. 4272. 4296. 4320. 4344. 4368. 4392. 4416. 4440. 4464. 4488. 4512. 4536. 4560. 4584. 4608. 4632. 4656. 4680. 4704. 4728. 4752. 4776. 4800. 4824. 4848. 4872. 4896. 4920. 4944. 4968. 4992. 5016. 5040. 5064. 5088. 5112. 5136. 5160. 5184. 5208. 5232. 5256. 5280. 5304. 5328. 5352. 5376. 5400. 5424. 5448. 5472. 5496. 5520. 5544. 5568. 5592. 5616. 5640. 5664. 5688. 5712. 5736. 5760. 5784. 5808. 5832. 5856. 5880. 5904. 5928. 5952. 5976. 6000. 6024. 6048. 6072. 6096. 6120. 6144. 6168. 6192. 6216. 6240. 6264. 6288. 6312. 6336. 6360. 6384. 6408. 6432. 6456. 6480. 6504. 6528. 6552. 6576. 6600. 6624. 6648. 6672. 6696. 6720. 6744. 6768. 6792. 6816. 6840. 6864. 6888. 6912. 6936. 6960. 6984. 7008. 7032. 7056. 7080. 7104. 7128. 7152. 7176. 7200. 7224. 7248. 7272. 7296. 7320. 7344. 7368. 7392. 7416. 7440. 7464. 7488. 7512. 7536. 7560. 7584. 7608. 7632. 7656. 7680. 7704. 7728. 7752. 7776. 7800. 7824. 7848. 7872. 7896. 7920. 7944. 7968. 7992. 8016. 8040. 8064. 8088. 8112. 8136. 8160. 8184. 8208. 8232. 8256. 8280. 8304. 8328. 8352. 8376. 8400. 8424. 8448. 8472. 8496. 8520. 8544. 8568. 8592. 8616. 8640. 8664. 8688. 8712. 8736. 8760. 8784. 8808. 8832. 8856. 8880. 8904. 8928. 8952. 8976. 9000. 9024. 9048. 9072. 9096. 9120. 9144. 9168. 9192. 9216. 9240. 9264. 9288. 9312. 9336. 9360. 9384. 9408. 9432. 9456. 9480. 9504. 9528. 9552. 9576. 9600. 9624. 9648. 9672. 9696. 9720. 9744. 9768. 9792. 9816. 9840. 9864. 9888. 9912. 9936. 9960. 9984. 10000.

WASHERS
1 doz. 1/4 or 1/2 1c

CELLULOID
12x15 10c
12x18 15c
12x24 20c
12x30 25c
12x36 30c
12x42 35c
12x48 40c
12x54 45c
12x60 50c
12x66 55c
12x72 60c
12x78 65c
12x84 70c
12x90 75c
12x96 80c
12x102 85c
12x108 90c
12x114 95c
12x120 1.00
12x126 1.05
12x132 1.10
12x138 1.15
12x144 1.20
12x150 1.25
12x156 1.30
12x162 1.35
12x168 1.40
12x174 1.45
12x180 1.50
12x186 1.55
12x192 1.60
12x198 1.65
12x204 1.70
12x210 1.75
12x216 1.80
12x222 1.85
12x228 1.90
12x234 1.95
12x240 2.00
12x246 2.05
12x252 2.10
12x258 2.15
12x264 2.20
12x270 2.25
12x276 2.30
12x282 2.35
12x288 2.40
12x294 2.45
12x300 2.50
12x306 2.55
12x312 2.60
12x318 2.65
12x324 2.70
12x330 2.75
12x336 2.80
12x342 2.85
12x348 2.90
12x354 2.95
12x360 3.00
12x366 3.05
12x372 3.10
12x378 3.15
12x384 3.20
12x390 3.25
12x396 3.30
12x402 3.35
12x408 3.40
12x414 3.45
12x420 3.50
12x426 3.55
12x432 3.60
12x438 3.65
12x444 3.70
12x450 3.75
12x456 3.80
12x462 3.85
12x468 3.90
12x474 3.95
12x480 4.00
12x486 4.05
12x492 4.10
12x498 4.15
12x504 4.20
12x510 4.25
12x516 4.30
12x522 4.35
12x528 4.40
12x534 4.45
12x540 4.50
12x546 4.55
12x552 4.60
12x558 4.65
12x564 4.70
12x570 4.75
12x576 4.80
12x582 4.85
12x588 4.90
12x594 4.95
12x600 5.00
12x606 5.05
12x612 5.10
12x618 5.15
12x624 5.20
12x630 5.25
12x636 5.30
12x642 5.35
12x648 5.40
12x654 5.45
12x660 5.50
12x666 5.55
12x672 5.60
12x678 5.65
12x684 5.70
12x690 5.75
12x696 5.80
12x702 5.85
12x708 5.90
12x714 5.95
12x720 6.00
12x726 6.05
12x732 6.10
12x738 6.15
12x744 6.20
12x750 6.25
12x756 6.30
12x762 6.35
12x768 6.40
12x774 6.45
12x780 6.50
12x786 6.55
12x792 6.60
12x798 6.65
12x804 6.70
12x810 6.75
12x816 6.80
12x822 6.85
12x828 6.90
12x834 6.95
12x840 7.00
12x846 7.05
12x852 7.10
12x858 7.15
12x864 7.20
12x870 7.25
12x876 7.30
12x882 7.35
12x888 7.40
12x894 7.45
12x900 7.50
12x906 7.55
12x912 7.60
12x918 7.65
12x924 7.70
12x930 7.75
12x936 7.80
12x942 7.85
12x948 7.90
12x954 7.95
12x960 8.00
12x966 8.05
12x972 8.10
12x978 8.15
12x984 8.20
12x990 8.25
12x996 8.30
12x1000 8.35

WOOD, WATER SPRAYERS
1/2 10c
1 20c
2 30c
3 40c
4 50c
5 60c
6 70c
8 80c
10 90c
12 1.00
14 1.10
16 1.20
18 1.30
20 1.40
24 1.60
30 1.80
36 2.00
42 2.20
48 2.40
54 2.60
60 2.80
66 3.00
72 3.20
78 3.40
84 3.60
90 3.80
96 4.00
102 4.20
108 4.40
114 4.60
120 4.80
126 5.00
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150 5.80
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186 7.00
192 7.20
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948 32.40
954 32.60
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966 33.00
972 33.20
978 33.40
984 33.60
990 33.80
996 34.00
1000 34.20

WHEELS PER PR.
Breh Bala Celu
1/2 .02 .04 .05
1 .03 .05 .07
1 1/2 .04 .08 .10
1 1/2 .07 .10 .16
3 .15 .15 .30

SHEET ALUM.
1/16 4 for 1c
2 sheets 3c
100 in. 65c
100 in. 65c

5-FOOT Balsa
1/2x1/16 12 for 20c
3/16x1/16 10 for 20c
1/2x1/16 8 for 20c
3/16x1/16 6 for 20c
1/2x1/16 3 for 20c
3/16x1/16 2 for 20c

PNEUMATIC AIR WHEELS
3 1/2" pair 1.50
4 1/2" pair 2.00
5 1/2" pair 2.50
6 1/2" pair 3.00
7 1/2" pair 3.50
8 1/2" pair 4.00
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99 1/2" pair 49.50
100 1/2" pair 50.00

MOTOR FUEL
1 Pint .30
1 1/2 Pint .30
2 Pint .30
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FLIGHT TIMER
50 Sec. .30
100 Sec. .30
150 Sec. .30
200 Sec. .30
250 Sec. .30
300 Sec. .30
350 Sec. .30
400 Sec. .30
450 Sec. .30
500 Sec. .30
550 Sec. .30
600 Sec. .30
650 Sec. .30
700 Sec. .30
750 Sec. .30
800 Sec. .30
850 Sec. .30
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5950 Sec. .30
6000 Sec. .30
6050 Sec. .30
6100 Sec. .30
6150 Sec. .30
6200 Sec. .30



SAY FELLOWS:

WE ARE PASSING ON OUR LATEST ENGINEERING ACHIEVEMENTS TO YOU. THE NEW *PACIFIC ACE* AND *MISS TINY* ARE OF SUCH ADVANCED DESIGN THAT ALL OTHER MODELS ARE NOW AS OBSOLETE AS A WORLD WAR JENNY. CLIMB?-LIKE A HOME SICK ANGEL. GLIDE?-LIKE A SEA GULL RIDING THE GRANDAD OF ALL THERMALS. APPEARANCE?-THE MOST BEAUTIFULL OF ALL.

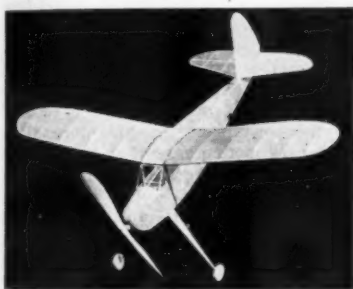
SEE YOU AT THE NATIONALS - *Barney Snyder*



MISS TINY

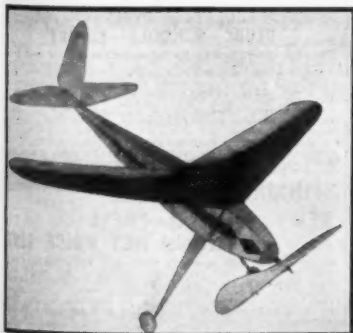
Model experts stand in awe at the performance of this new Tiny sensation.

A pocket edition of the Pacific Ace, 46" constant cord wing. Miss Tiny has a record of 24 1/2 minutes on a 45 second engine run. For Ohlsson 23, Phantom and other 1/2" engines. Wing span, 46". Deluxe Kit contains spun cowl, silk, 2 1/2" Volt Air Wheels, cement, dope, die-cut ribs, plenty of good balsa, and full size plans. Price.....\$3.95
Standard Kit same, but with bamboo paper covering.....\$2.95
Dry Kit complete except for wheels, covering, cement and dope.....\$1.95
Plans Only......25



30 in. PACIFIC ACE

A practical and durable commercial model. Easily constructed from well drawn and detailed plans. Kit contains an ample supply of first grade wood and high quality cement. Comparable with and out-rips most dollar kits. Add 10c for postage. **25c**



RECORD WRECKER

Newest Modelcraft Sensation! With a 26" span the Record Wrecker includes freewheeling unit, rubber tube, contest rubber, best quality balsa, cement, dope, and large full size plans. **50c**
Add 10c for postage.

THE
MODELRAFT
AWARD

★

\$100.00

will be awarded to

the winner of the 1939 nationals providing he is flying a MODELRAFT gas job. Be a winner! Buy a Modelcraft Kit and get in the Champion class. Start right now—send for our FREE Catalog of latest Gas and Rubber Models and Supplies.

NOTICE TO DEALERS

We will pay \$25.00 to the dealer who sells the winning Modelcraft Gas Kit in the 1939 Nationals.

55 Minutes on 30 Second Engine Run



1939 PACIFIC ACE GAS MODEL

New throughout, with latest improvements in design and construction. Flying weight 3 lbs., 4 oz. Wing span 66 in., tapered from 12 to 5 1/2 in. Kit contains tapered spars, beveled and tapered trailing edge, die-cut ribs, turned aluminum cowl, 1 qt. gas dope, 1 pt. cement, 3 1/2 yds. super silk, formed landing gear, 4 1/2 in. inflatable air wheels, dural wire, alum. tube, washers, bolts, haskalite, dural sheet, hook up wire, switch, selected hard balsa, full sized, black and white plans with test flight instructions, complete.....**\$8.50**

Standard Kit with bamboo paper, 1/2 pt. of dope, 1 pt. of cement and 3 1/2 in. air wheels.....**\$6.25**

Dry Kit same as above without cement, dope, silk or wheels.....**\$4.75**

BRAT



Original light class motor. The Power Plant for Champions.
SPECIFICATIONS
Bore 9/16", Stroke 3/8"
Bare weight 3 1/2 ozs., Overall height 3 1/4"
.....\$16.50 Post Paid

TROJAN JR.



The only motor using Roller-Bearings.
SPECIFICATIONS
Bore 3/4", Stroke 3/8"
Light, Weight 3 1/2 ozs., Overall height 3 1/4"
.....\$16.50 Post Paid

OHLSSON ENGINES



GOLD SEAL
For that extra margin of performance.
SPECIFICATIONS
Horsepower 1/2, Bore 7/8", Stroke 13/16", 500 to 10,000 r.p.m.
.....\$16.50 Post Paid



MODEL "23"
Choke-full of power, speed and stamina!
SPECIFICATIONS
Horsepower 1/2, Bore 5/8", Stroke 3/4", Bare weight 4 1/2 ozs., Height 3 9/16"
.....\$16.50 Post Paid

BROWN MOTORS



We carry a complete stock of Brown Motors and Parts.

Model "D" \$10.00 Post Paid
Model "C" \$17.50 Post Paid
Model "B" \$21.50 Post Paid
Model "M" \$15.00 Post Paid

HI-SPEED



1/7 H.P. 6500 R.P.M. Weight bare 3 1/2 oz. Runs upright or inverted; fully assembled, complete with coil and condenser.

\$12.75 POSTPAID

MODELRAFT

★ THE LEADING SUPPLY HOUSE OF THE WEST ★

1006 SOUTH VERMONT AVENUE, LOS ANGELES, CALIF.

BUD WARREN Says:



Bud Warren block testing Tom Thumb engines.

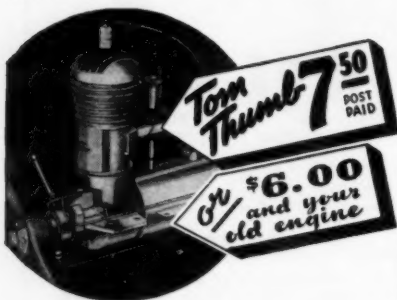
"When it comes to gas models I believe we are all alike! To be your pride and joy a gas model must stand ready for every flight with the 'hottest,' easiest starting, powerful gas engine that ever turned a prop.

"You can bet that each Tom Thumb engine I fly is such a motor. I have made it my daily business to make sure every Tom Thumb 'winds up' on the test stand to meet my own personal standard of performance. It is an everlasting pleasure to take a brand new fully tested Tom Thumb motor, pack it for mailing and know that its performance will win a new gas model friend.

"Everyone appreciates the low cost, and all agree that you must own a Tom Thumb to know the matchless performance of this most modern engine."

SPECIFICATIONS and HOW to BUY the NEW TOM THUMB

The Tom Thumb is the most powerful easy starting 1/5 H.P. engine made. Clip the coupon below, enclose money order for \$7.50 (also your old motor for special \$6.00 offer), and receive a brand new assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore $\frac{1}{8}$ " ; Stroke $\frac{1}{4}$ ".



WARREN SALES & SERVICE
412 Brett St. Inglewood, Calif.

☐ Rush me one new Tom Thumb Engine. I enclose \$7.50.

☐ Rush me one new Tom Thumb Engine. I enclose \$6.00 and my old engine (any make) including all parts regardless of condition.

I intend to run my Tom Thumb—
☐ Upright ☐ Inverted

Street _____

Name _____

City _____ State _____

jackets and a silk core supplied the rigging, or shroud lines. The parachute was now also packed into lap and chest packs, as well as seat and back packs. These retained the spring pilot-chute, and other operating characteristics of the original designs.

This type of parachute, known commercially to civilians pilots the world over as the Irvin Air Chute, was such a success that governments all over the world have adopted the design of the Parachute Board as their official parachute.

Thus was the modern parachute born, nursed into hostile surroundings by a group of men who were able to see their job and do it. Over 2,000 men owe their lives to this group. And, in the period that followed the development of the Type S 'chutes, a stamp of approval was put upon the work of the Parachute Board by the adoption, in successive years, of rulings making it compulsory for all fliers in government planes to wear approved type parachute.

Frontiers of Aviation

(Continued from page 21)

The Lockheed Aircraft Corporation, which was considered one of the smallest companies in the western aircraft industry a year ago, now has over a \$30,000,000 backlog which is well above Douglas, the former leader of the entire U. S. aircraft industry. It might be remembered that while Douglas was astounding the world with its DC transports, an achievement in itself, the company had many other projects up its sleeve. While the success of the transports would have made any other company content, Douglas copied orders for over 300 bombers, grabbed a surprise order for 114 torpedo bombers, not to mention a large amphibion for the army, a twin-engined patrol bomber for the navy, the building of several commercial DF flyingboats for export, and the bidding on observation contracts. Then with the development of the DC-4 on their hands they go to work on a giant for Pan-American Airways (not yet ordered), a six-engined bomber for the Army, as well as the forthcoming DC-5 and a super attack-bomber! Scattered about the engineering department are still other odds and ends.

As we look at Lockheed today the very same thing is happening to them, a repeat splurge. About once a day someone comes up and tells us that Lockheed is building a pursuit plane for the army that is expected to do very great things, and each has a different version of its physical and progressive aspects. However, the fact is that Lockheed has been thinking in terms of pursuits for a long time. Other new Lockheed developments which we have related before are the new navy ship with nose wheel, the Model 22 which is definitely under way, and the Vega development. The Model 22 is an attack-bomber powered by Allison engines that will have performance plus. By the time this is read the firm of the Lockheed "Hudsons" for England will have gone through its test flights.

In the commercial branch Lockheed is well under way with their 27 passenger transport and have already started on the

design of a 35 passenger airliner which is real news. This plane will have a very radical design feature if it can be proved successful in the wind tunnel tests that are now going on. It will be a tail-first airplane! The horizontal stabilizer and elevators will be located in the nose of the plane with the vertical tail in its usual place at the rear of the fuselage. The midwing will join the fuselage at about midship, and it is said that two very powerful engines, located in the wing, will power the airplane. A tricycle landing gear will be employed. This type of landing gear is the probable reason why Lockheed has gone for the tail in the nose business as it will lend better proportions to the airplane. There will not be that high, cumbersome-looking tail hanging in the back as the wing will be located further aft with the front stabilizer taking up part of the lift.

There is another company in the United States now that plans to build a four-engined plane along very similar lines. Something else of a radical nature is the re-evolution of the gyroplane. There are certain interests in the East who are very prominent in the aviation industry and are working on what looks like the answer to a gyroplane designer's dreams. Two rotors are mounted on full-cantilever shafts extending from the bottom of a very well designed fuselage. The streamlining is superb. An enclosed cabin seating about four people in the nose of the plane offers very good visibility with no wings to shut off the view. A retractable tricycle gear is a feature, and all in all it may be this plane that will prove the success or downfall of the gyroplane. As you know a gyroplane is very similar to an autogyro except that its rotors are directly connected to the powerplant and give forward and backward motion as well as lift to the aircraft. The drawings which we have seen of this craft really have GO to their lines. The government is appropriating huge funds for the development of rotary aircraft in its quest to simulate the flight of a humming bird.

One of the larger aircraft organizations that has not been so well off financially

Balsa Wood STICKS, SHEETS, BLOCKS, SAW-CUT Propellers

MANUFACTURERS! — DEALERS — JOBBERS CLUBS — SCHOOLS — EXPORT

SELLEY again has perfected an entirely new and best method of cutting balsa, enabling us to produce in 1 hour what ordinarily would require 6 hours to do. Hence, this saving in labor cost is passed on to you at these **NEW SENSATIONALLY LOW PRICES**. Our Saw Cut Balsa propellers are the finest cut and most accurate true pitched props available. We are prepared to furnish sizes from 3" to 10" in any quantity on short notice.

And now, an unfailing, reliable source for the best selected grade of the **MOST ACCURATE AND SMOOTH CUT** sheets, sticks and saw cut propellers at surprisingly **NEW LOW PRICES**.

SPINNINGS — COWLS, RINGS AND SPINNERS for the trade.

NEW! — Just off the PRESS
Confidential NET PRICE LIST

Every dealer will find this the **MOST COMPLETE LIST** ever compiled for the Model Industry, all basic and Raw Materials, Special Wood Parts, Wheels, Die-Cut Airplane and Boat items, Borwood Parts, Dope, Rubber, Paper, in fact, hundreds of items that can only be supplied from one source at the **Lowest possible Prices**.

WE GUARANTEE complete satisfaction, service. Our reputation is for High-Class Workmanship and the Finest Quality in Model Products.

IMPORTANT — We will mail this list to legitimate dealers only. Use your letter head. Post cards positively will not be acknowledged. Before placing your next order, write for our price list and see our prices before ordering.

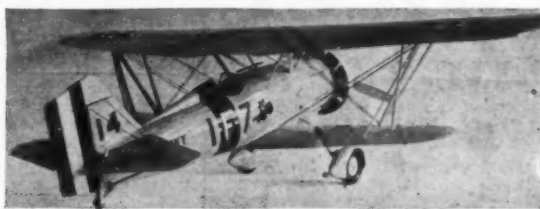
SELLEY MANUFACTURING COMPANY, INC.

Dept. 103 1377 Gates Avenue, Brooklyn, N. Y.

NEW CURTISS HAWK F11C4 NAVY PURSUIT

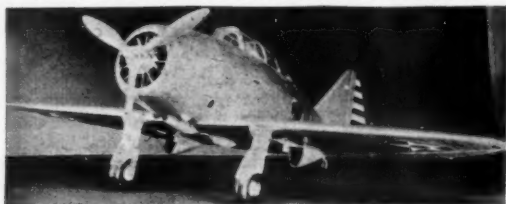


32 1/2" Span. Length 22 3/4". 1" Scale. Weight 6 oz. Color gray, top wing yellow.



THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 4 1/2" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4 1/2" aluminum cowl, 10" steel type carved prop shown, 2 1/2" wheels, tail wheel, star and rudder insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walk, ready cut wheel pants, washers, 3 oz. grey paint, 1/2 oz. yellow, 1/2 oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood. 33"x44" scale drawing. \$4.50

NEW SEVERSKY P35 ARMY FIGHTER



32" Span, Length 25". 1" Scale. Color, Silver

A brand new model of the 1938 Bendix Trophy Winner P 35. Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, 1/2 oz. black, 2 oz. glue, etc. insignia and full size scale drawing. Const. set in labeled gift box. Postpaid. \$2.95

NEW LOCKHEED ARMY SPEED VEGA



30 1/4" Span, Length 21". Scale 3/4". Color, Blue and Yellow.

This model with its bullet-like body and high lift type wing is one of our best flyers and most stable. It is handsome to look at and very strong. Const. set contains all parts printed on balsa, a 3-3/16" turned balsa motor front, 9" carved hardwood propeller steel type shown, colored insignia, rubber motor, celluloid, wire, complete set of colored paints, glue, etc. Special wheels, tail wheel, full size scale drawings, and all parts to build as shown. CONST. SET COMPLETE in labeled gift box. Postpaid. \$2.95

NEW LOCKHEED P23A NAVY FIGHTER

COMBINATION LAND AND SEA PLANE SET
32" Span. Length 20 1/2". Weight 3 1/2 oz. 3/4" Scale.

Model will rise from land or water in few feet. Construction set contains fuselage and poston farmers, wing ribs, tips, etc., printed on balsa, a 3 1/2" turned cowl front, 2 instrument boards, colored insignia, lettering, windshields, 9" carved scale flying prop shown, 3 oz. silver paint, 1 oz. cement, 1/2 oz. black, 2 oz. glue, ready cut wheel pants, strong 2" aluminum wheels, 12 feet of rubber, and large 33"x44" drawing of land and sea plane. This is a sensational model and only one of its type in the world. Construction Set in labeled gift box. Postpaid. \$2.95

BOEING F4B4 NAVY FIGHTER



22 1/2" Span, Length 14 1/2". 3/4" Scale

Set has 3" celluloid motor, 3 1/4" tapered aluminum cowl ring, set of paints, etc. Postpaid. \$2.95

Notes: Orders sent west of Mississippi, Canada, or Foreign, add 20c postage

BOEING P26A ARMY PURSUIT



22" Span, Length 17 1/2". 3/4" Scale

Set has 3" celluloid motor, 3 1/4" tapered aluminum cowl ring, paints, etc. Postpaid. \$2.75

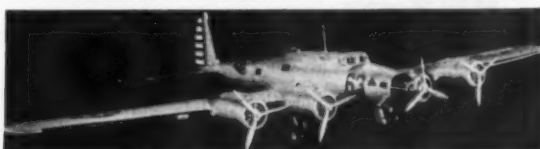
NORTHROP A-17 ARMY FIGHTER



24" Span, Length 17". 1/2" Scale

Set has 7" prop, turned motor front, wooden wheels and complete set of paints. Postpaid. \$2.50

BOEING B-17 ARMY FLYING FORTRESS



44" Span, Length 30". Weight 5 oz. Color, Silver

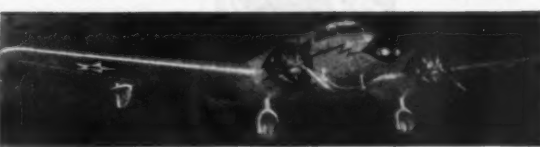
This is the only scale model of this plane in the world, and a sensation to look at. Set has all parts printed on balsa, 4 turned balsa motor fronts, 4 carved steel type props, celluloid wheels, rubber motors, 3 oz. silver paint, 1/2 oz. black, 2 oz. glue, etc. Full size large scale drawing, and all parts to build. Const. set in labeled box. Postpaid. \$5.50

BOEING F4B4 NAVY FIGHTER
SOLID EXHIBITION MODEL

22 1/2" Span, Length 14 1/2". Color Grey, etc.

This is the finest solid exhibition model ever produced. Set contains completely finished balsa fuselage, with cockpit cut out, motor hole cut out and headrest attached; all you have to do is paint it. The wings, tail and rudder are all cut to shape, but have to be sanded to proper curve. A 5" celluloid motor with aluminum motor front, 3 1/4" tapered aluminum cowl, 7" scale chromium plated propeller, 4 cast bombs, 3 celluloid wheels, tail wheel, complete set of colored paints, glue, filler and all other parts with full size drawing. Set, postpaid. \$4.50

LOCKHEED ELECTRA EXHIBITION MODEL



27 1/2" Span, Length 19 1/2". Scale 1/2"

Plans approved authentic by Lockheed Aircraft Corp. This is a De Luxe model with special equipment. Set includes two 2" celluloid motors, aluminum motor fronts, two 2" aluminum cowl, two 4" three-bladed aluminum props, two 1 1/4" M & M pneumatic air wheels, all parts printed on balsa, set of colored paints, glue, etc. This is the finest transport model made. Set, postpaid. \$4.50

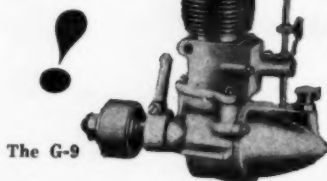
Standard Set No. 2, same as above without special equipment. Flying model type. Set, postpaid. \$2.95

NEW 20-PAGE CATALOG, beautifully illustrated, with large photos of the world's finest scale models. SEND 10c COIN.

MINIATURE AIRCRAFT CORP., 83 Low Terrace, Staten Island, New York

Power

P-L-U-S



The G-9

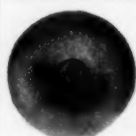
\$10.00

Post Paid in U. S. Only

Weight—bare—9 oz.
Bore $\frac{1}{8}$ "
Stroke $\frac{15}{16}$ "
H.P.—1/5 plus

R. P. M.—from 300
to 7,000 with 13"
prop. up to 10,000
with flywheel.

If you are satisfied with mediocre performance, you will not be interested in the "G-9"—but—if you take pride in real powered flights, with a real gas engine,—your choice must be a "G-9." Its finger tip carburetion—sturdy construction and super power—and consistent performance—is fast becoming World known.



IMPNUMAT BALLOONS

1.25 Per Pair
Post Paid

(Made according to our
specification by one of the
largest Tire Manufacturers
in the world.)

3 1/2" Dia. x 1 3/4" (wt.—3 1/2 oz.)

The Perfect Pneumatic Tires—Puncture and Blow Out Proof—made of the finest India Rubber. Tested—no danger of leakage—no pumping or blowing. You never land on a flat, with an "IMPNUMAT."

**YOUR NEXT JOB
WILL LOOK BETTER
AND LAST LONGER
IF YOU COVER IT WITH**

3 SHEETS

(24x36 in.)

25c

postpaid

Pervel

Time Magazine refers to this new American invention as the Sixth Fabric. Re-orders from our dealers, and unsolicited testimonials from model/builders who take pride in their work—show us that "PERVEL" has caught on. You too can enjoy this perfect covering. At your dealer's or direct.

1938 Prize Winner

A handsome chromium propeller clock, (value \$10.00) was presented to Peter Ferrari, 35 Main Street, Shelburne Falls, Mass. The judges selected his photos of our

Rearwin Speedster,

as the best submitted for 1938. Entry blanks are packed in each kit. Enroll now for 1939. This perfect kit—54" wing span—with everything necessary for the perfect gas model—only **\$4.50.** Plus 30c Postage.

Send 10c for complete catalogue of airplanes, boats, trains, engines, propellers, charts and diagrams.

All prices quoted above, are for the U. S. A. only. Foreign orders should add 20% to cover packing and cartage.

International Models
251 West 55th Street, Dept. M
New York City

as most of its competitors is the Aviation Manufacturing Corporation formerly headed by E. L. Cord. Since its reorganization, plans have been made for its complete recuperation with many new designs just in the offing. The corporation is made up mainly of Lycoming (maker of engines), Stinson, and Vultee. Stinson is the company that is liable to horn in on the government trainer business. From what we hear they have two new promising designs coming up, namely a twin-engine trainer powered by engines in the neighborhood of the 275 hp. class and a 75 hp. sportplane. The sportplane is undoubtedly destined to be a further step-up in the Aeronca-Piper class with Lycoming doing the engine work.

Vultee has just produced a new V-12 single-engine attack plane with a new enclosure and flush riveting. Flight tests have been conducted at the company's field and at Union Air Terminal. The top of the fuselage has been raised so as to form a fairing aft of the enclosure, and perhaps a few more miles per hour have been added thus.

Specifications follow:

High speed—sea level—217 m.p.h.
Top speed (7,500 ft.)—235 m.p.h.
Top speed (19,000 ft.)—243 m.p.h.
Cruising speed (15,000 ft.)—218 m.p.h.
Landing speed—69 m.p.h.
Service ceiling—25,500 ft.
Maximum range—1,200 miles.
Span—50 ft.
Length—37 ft 5 1/2 in.
Height—10 ft.
Wing area—384 sq. ft.
Wing loading:

Attack mission—25.9 lb./sq. ft.

Bombing mission—31.4 lb./sq. ft.

Lately Northrop has been flight testing an A-17 attack ship which will go to Peru. And here are some further details on the new Douglas DC-5.

Wing span—78 ft.
Length—60 ft. 2 in.
Gross weight—18,250 lb.
Engines—850 hp.
Cruising speed—169 m.p.h.
Passenger capacity—16.
Crew—3.

At the take-off the DC-5 can span a 50 foot obstacle with a run of only 670 feet. An extraordinary feature of the little transport is that the two main wheels of the tricycle landing gear swing outward and upward, retracting into the outer wing panels instead of the engine nacelles. A single rudder will be employed with a steel keel in the belly of the fuselage for accidental wheels-up landings.

The only noticeable change, after its extensive tests, in the DC-4, big brother of the DC-5, is the addition of a long fairing to the leading edge of the stabilizer. The ship is now ready to be turned over to the airlines.

Since the crash of Allan Lockheed's new twin-engine plane during test flights a few months ago everything has been quiet on the Lockheed front until recently, when word comes that Mr. Lockheed has entered the light-plane business and is now building the first experimental ship. Mr. Lockheed, as you know, is no longer connected with the Lockheed Aircraft Corp., mentioned in this article.

Specifications of the new Seversky Executive are as follows:

Span—36 ft.
Length—27 ft. 4 1/2 in.
Wing area—220 sq. ft.
Gross weight—6,735 lb.
Wing loading—30.6 lb./sq. ft.
Fuel capacity—170 gal.
Top speed—330 m.p.h.

Of interest is the giant propeller spinner which covers almost the entire frontal area of the engine. This feature may be seen on other products of 1939.

Rapid progress in the construction of the DC-5—air transportation's latest "common denominator,"—was reported here today by Douglas Aircraft Company's engineers.

Present indications are the new plane will be test flown by Major Carl A. Cover, Senior Vice-President of the company, around February 15.

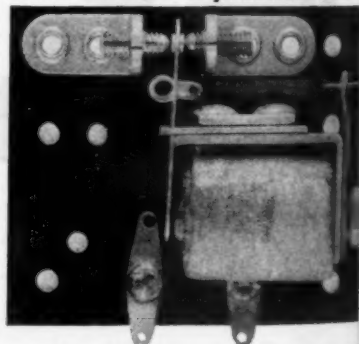
Designed by Douglas to meet requirements of feeder-line operations and commercial flying over routes now only partly covered by transcontinental lines, the DC-5 incorporates every advance and advantage of the latest super sky-liner with the maneuverability, ease of operation and economy of smaller aircraft so desirable for this type of service.

The new plane is designed for 16 passengers and a crew of three. Deep, upholstered chairs and interior arrangement of the cabin are equal in luxury and comfort to the best standards of modern sky giants. Scientific sound-proofing and location of the engines in the high wing even further reduce noise and vibration of old-fashioned flying equipment.

The metal wing of the DC-5 is 78 feet from tip to tip. Into it is built a retractable landing gear and the engine mounts. Controls, engine and other installation parts of the DC-5 have been designed to be interchangeable with the universally-used DC-3.

RADIO CONTROL

Now reduced to practical use.



America's foremost ignition coil experts have just developed a practical radio control for the ship you NOW HAVE. The basic unit weighs under 8 ounces and can be added to as desired for extra controls. Shown above is our new 2 OUNCE super-sensitive relay made to match our 1/2 62-gal.-filled tube. Together they make a one tube receiver to install in the ship. The relay has a vibration-proof balanced armature, silver contacts, and a 10,000 ohm coil and sells for \$4.00.

The special control tube is \$3.50. De luxe job weighs less than 3 pounds and controls motor speed and rudder or elevators. Continuously variable and reversible controls which are quite superior to the old-fashioned step-by-step methods. It is not necessary to go through right-rudder positions to get to left-rudder, etc.

Send 25c for booklet giving complete information and operating details. Don't forget that we still make the world's best ignition coil and you will avoid a lot of grief if you specify one on your next engine.

NATHAN R. SMITH MFG. CO.
1814 West 8th St., Los Angeles, Calif.

We Guarantee You the Finest Motor REGARDLESS OF PRICE!

Here's What YOU are

Interested in—

POWER!

\$975

A \$21.50 Value

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DROP FORGED DURAL
1" BEAM CONNECTING
ROD BRONZE BUSHING

HARD PHOSPHOR BRONZE
MAIN BEARING FORCE
FEED LUBRICATION

ENCLOSED ADJUSTABLE TIMER
THAT WORKS PERFECTLY

FULL COUNTER BALANCED CRANK SHAFT

HIGH TURBULENCE DOMED HEAD

SPECIAL PROCESS HARDENED
FEATHER WEIGHT STEEL PISTON

MANIFOLD
EXHAUST

CHAMPION
SPARK PLUG

DOUBLE 24"
HEAVY DUTY COIL

METAL ENCLOSED
CONDENSER

NEW ALLOY
DOUBLE STRENGTH
DIE CASTING

RADIAL OR LUG MOUNTING

SPECIFICATIONS

Displacement, 11.32 c.c.—15/16 Bore—15/16 Stroke—
4 Port—2 Cycle—1/4 Horsepower—Weight Bare 8 oz.

Special James Combination

James Motor, value.....\$21.50
Blue Star Gas Kit Dry, value..... 5.00
Hi-Rev. Precision 13" Prop., value..... 1.50

Total Value \$28.00

Your Price ALL 3... **\$12⁸⁵**
Postpaid

De Luxe Combination

James Motor, Value.....\$21.50
Blue Star Gas Kit Dry, Value..... 5.00
Balloons Tire Wheels 3 1/2", Value..... 1.50
Accurate Light Weight Flight Timer..... 1.50
Hi-Rev. Precision 13" Prop., Value..... 1.50

Total Value \$31.00

Your Price Complete..... **\$13.85** Post-
paid
"Boy! What a deal."

THE JAMES MOTOR IS
PRECISION BUILT AND
HAND LAPPED FOR HIGH
SPEED—7500 R. P. M. WITH
13" PROP. ACTUAL VALUE
\$21.50

NOW

\$975
Postpaid
in U.S.A.

I'VE BEEN TELLING YOU
ALL THE TIME . . . IT
TAKES POWER TO
WIN CONTESTS!



The Gas Model Aeroplane Association of Southern California, Inc. held their Semi-Annual Meet December 11, 1938. There were over five thousand people present and over four hundred and fifty entries. The Douglas Aircraft Company offered a Silver Trophy for the Low-Wing Event.

Model builders competing were experts and they all wanted to win that cup.

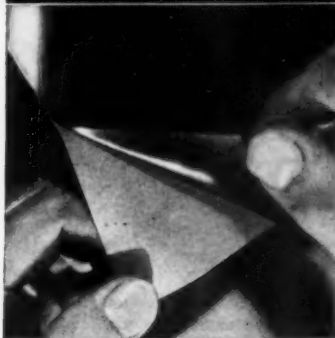
Now this Low-Wing job is a very difficult plane to build. It was copied after the Government fighting planes. It had a five foot wing-spread and was very fast and had to have a lot of power to get altitude. These planes weighed in at four pounds fourteen ounces each, with a one ounce leeway. THE LOW-WING SHIP powered with the JAMES MOTOR won this event!



James Motor

THE GREAT WESTERN
AIRPLANE COMPANY, INC.
1700 W. ADAMS, LOS ANGELES, CALIF.

PLANEFILM—the Perfect Covering for Model Planes



Removing tough, flexible PLANEFILM from its backing sheet ready to apply to any model.

WORKS LIKE MAGIC

STRETCHES ITSELF DRUMLIKE

No Wrinkles—No Seams—Easy To Apply

After painstaking hours of tedious work you complete the framework and find yourself confronted with the problem of covering it.

The covering represents your finished model. Why, then, isn't it very important to use the most practical, attractive and efficient covering obtainable? The answer is PLANEFILM. The most inexperienced builder will marvel at his results.

The first cost of your PLANEFILM covering is the last. No glue, no dope and no color finish. PLANEFILM is absolutely complete as a covering when it reaches your hands. Tough, elastic, beautiful and one half the weight of the usual plane covering. PLANEFILM spells high luster finish, faster climb, more speed, far less skin friction, slower glide, less chance of wing flutter, all because of the even distribution of weight and the drumlike effect possible with this new revolutionizing scientific development.

We never dreamed of the enthusiastic response we have had, letters are pouring in by the hundreds every day.

Jobbers, retailers, and users, write immediately for further detail.

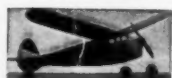
PLANEFILM DIVISION

LOCK BOX 166

DAYTON, OHIO, U.S.A.

JOIN THE 1939 WINNERS!

WITH SMALL GAS MODELS



BAY RIDGE
MIKE
Detroit National
Winner
45" Wingspan
32" Length

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The Fokker D-23 Fighter

(Continued from page 9)

factories in Germany, was moved from one country to another while the world looked the other way!

That was the start of the great N. V. Nederlandsche Vliegtuigenfabriek Fokker of today, one of the largest in the world. This firm is designing and constructing fighting craft for governments the world over and their latest design is the Fokker D-23 Fighter, the strange craft slashing across our cover this month.

Were we to offer a prize for a commercial Original Design Contest this unorthodox craft would most certainly be the recipient of first place for in its pusher-tractor engine arrangement, twin-rudder tail boom design, and tricycle landing gear resides all that is startlingly new and revolutionary in fighting plane construction. At first glance the D-23 appears to be a further development of the twin-engine Fokker attack monoplane model G-1 "Faucheur" which appeared late in 1937, but only in respect to the tail-boom twin-rudder arrangement and the name they bear are the two ships alike.

The monoplane wing of the D-23 is of all-metal construction on the two-spar ribbed and panelled principle with plywood covering on both wing and ailerons. Split flaps hydraulically operated are located along the trailing edge of the wing both inboard and outboard, to the ailerons, of the tail booms. The fuselage is of all-metal structure being built up of welded

steel tubing and dural sheet covering. In addition the area at the sides, beneath and behind the pilot's seat have been augmented by additional armour plating of steel sheeting.

The tail booms are of dural monocoque construction and are mounted directly into the wing spars through the use of flanges riveted to small channels on the tail boom sections. At the extreme aft ends of the booms are located cantilever dural fins to which it is attached, and braced by, the horizontal stabilizer, which is also of all metal construction and mounted high in direct line with the rear propeller. To these horizontal and vertical stabilizers are attached the wide elevator and comparatively small rudder surfaces. Control surfaces are fabric covered; fins are plywood covered. Under each fin a bumper skid has been constructed to protect the tail surfaces and rear propeller in the event of a bad (nose-high) landing. The landing gear is of the now popular tricycle type with two conventional main landing wheels located at or near the center of gravity and retracting inward into the wing and fuselage. The nose wheel is of comparatively long travel Argus type and is equipped with the efficient Oler strut.

As a result of exhaustive tests on anti-shimmy appliances, the D-23 is equipped with a special oil-air anti-shimmy damper located at the top of the non-steerable nose wheel strut.

The nose wheel folds backward and upward into the belly of the ship and all three wheels are completely enclosed through the use of metal trap-door retracting covers.

Power for the D-23 is supplied by two identical Walter "Sagitta" type I.S.R. inverted V-12 motors manufactured in Prague, Czechoslovakia under difficulties too well-known to recount. These motors are air-cooled; the forward one by means of large louvres in the nose cowl, the rear one by the use of a special duct located under the belly of the fuselage about the center of the wing. Exhaust is by standard short-piping from small circular louvres along the cowlings. Each unit develops 528 horsepower at 13,400 feet and 570 horsepower at 16,500 feet which rates it as a definitely high-altitude engine. Both engines are fitted with Garrelli compressed-air starting systems.

Engine mounts are of welded steel tubing built integral with the fuselage and all dural covering is detachable for motor maintenance. These engines drive German V.D.M. constant-speed, three-bladed, all-metal, full-feathering airscrews. The rear motor and propeller are located on a center line ten inches above that of the forward motor. The direction of rotation is clockwise as opposed to standard American practice.

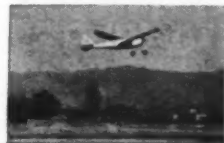
The pilot is located just forward of the leading edge of the wing and is completely enclosed by all-metal, glass enclosed hatches. The sliding glass hatch above his head is detachable in emergency, though it is doubtful what his fate might be should he attempt to leave his ship in mid-air with two whirling propellers wickedly flailing the air both before and behind him!

Mounted directly above him is an abnormally long and elaborate gun sight project-

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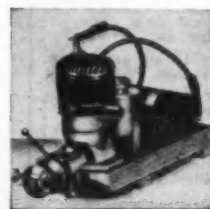
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ing forward on the nose cowl. Control stick is of the historic Fokker spade-grip-type and a cleverly conceived twin-throttle control is located at his left. In this, one or both motors may be speeded or retarded without confusing finger manipulation. Directly behind him is the main fuel tank with a capacity of 172 gallons, or sufficient for a cruising range of approximately 950 miles at three-quarters throttle.

Armament aboard the Fokker D-23 is potently supplied and effectively placed. In the nose, mounted just under the manifolds of the forward engine, are located two Browning F. N. machine-guns of 7.9 millimeters bore firing forward through the propeller and projecting from louvers in the cowl. In addition, two F. N.'s of 13.2 millimeters bore are situated in the extreme forward ends of the tail booms, projecting forward of the leading edge of the wing. The nose guns are capable of a rate of fire of 1300 rounds per minute; the outboard guns have a capacity rate of 1000 rounds per minute.

All ammunition is supplied through the use of the ingenious Fokker circular cartridge magazine located just forward of the wing within the cockpit. This feeds ammunition to the forward and outer guns through special link-conveyer belts. An extremely large ammunition supply, something like fifty thousand rounds, is carried. The nose guns fire standard cartridges but the outboard weapons use a special explosive bullet which has just recently been introduced. This explodes eight seconds after leaving the muzzle with a deadly fragmentary discharge. It appears explosive bullets have once more appeared flagrantly on the military scene, this time in a new and more terrible form: as a machine-gun cartridge and no mention of the international ban on its use (so often ignored of late) has been made.

The Fokker D-23 has not, at this writing, yet been flown. However, sources close to the Fokker staff disclose that a top speed of 330 miles per hour has been designed into the ship and will undoubtedly be surpassed. Although of comparatively small power (1140 horsepower) this high maximum speed may be directly attributed to the short span of the wing, the narrow fuselage and the general aerodynamic refinement of the entire structure. As the two Walter engines develop their maximum horsepower at 16,500 feet we may rest assured the Fokker D-23 is an high-altitude fighter and the large-gearing and super-charging of the "Sagitta's" will, in all likelihood, push the craft to upwards of thirty thousand feet maximum ceiling.

In a review of the general layout of the Fokker D-23 some advantages not readily grasped in a cursory glance become evident. This arrangement of aerodynamic and power features is radical in a ship of such important military functions. In the tiny Stearman-Hammond (which, with a motor in its nose would be a perfect replica of the Fokker) the preliminary design was for safety and stability. Inherent stability in a fighting ship is the most undesirable characteristic. This statement may sound strange but when it is explained that any tendency of a ship to return to Steady Level Flight from an unstable position in maneuver works a hardship on the pilot

the general layout of this strange new ship. Plan yourself just how you're going to construct the Fokker D-23; how you're going to fit the different parts together and how you're going to divide the ship up into different construction groups. There is a multiplicity of ways to construct this model but we believe our way is the simplest and easiest. If you'd rather work along more complicated lines for a more difficult but striking effect, please feel free to do so. But here's how we'd go about building a solid-scale Fokker D-23 model:

The fuselage is carved from a block of balsa $4" \times 1\frac{1}{4}" \times \frac{3}{4}"$ of a good, white grade. Lay off the side view on the block and cut out the outlines with a small hand or band saw. Draw in the top view and side view alternately and follow this procedure. Round the edges with a razor (well protected) taking care not to gouge too deeply and your fuselage is ready for sanding. Make templates from the cross section drawings on the plans and fit them to the indicated positions.

Take a heavy rough sheet of sandpaper and sand to approximate shape. Then use a medium followed by a fine-grained paper to smooth to exact template section. The wing is best made in two parts only, each panel joining at the fuselage. The booms are then attached to these at the appointed points. Draw the wing outline on a sheet of balsa $3\frac{1}{2}" \times 1\frac{3}{16}" \times \frac{3}{16}"$ and cut out with the band saw. Slice off the rough edges and follow the templates procedure outlined above. Sandpaper the airfoils down paying close attention to the wing section and use an extremely fine grade of sandpaper on the last few strokes.

The tail booms and tail assembly is made from balsa and the plans are self explanatory. Take especial pains with the two propellers making them from three lengths of balsa, or preferably white pine, glued at the center into the hub spinner. A model is judged by the accuracy of its propellers and remember that the props on the D-23 rotate exactly apposite to those American ships you've been used to building so don't, by force of habit, make them accordingly. The pilot's hatch may be colored in with India ink or built up of cellophane and bamboo or wire. The landing gears can be made retractable quite easily due to their simplicity and the trap doors may be made to close automatically simply by running a length of fine thread from their edges to a point across the path of the incoming wheels. In other words, glue a small piece of thread across the opening of the nose wheel retracting covers and they will fold neatly in with the wheel. An astonishing effect can be created by running thread to all three wheels and to a point at the rear or in the nose of the fuselage. Thus, by pulling these three threads, the wheels will fold upward and be followed in by their covers. Your friends will gasp at this if it is carefully studied out and well done.

Colors are red at the top and blue at the bottom of the rudder. The original D-23 was camouflaged but your ship might be painted a brilliant silver with black guns, motor exhaust stacks, control outlines and prop spinners. If the propellers are carefully made and attached, they may be made to revolve in opposite directions by blowing either from the front or the rear. The

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A Word To The Wise*(Continued from page 9)*

fine suggestions backed by a wealth of experience!

Now that you've a model club and members you'll be needing a set of by-laws or a constitution. . . . Avoid too many restrictions which result in stodgy sessions. . . . Meetings must have interest and pep so angle for some entertaining as well as instructive speakers, hold construction conferences, be sure to have members report

on the latest designs after competing in out-of-town meets, try a trek to the airport occasionally, but make arrangements before-hand so the operators out there can explain features of their new ships, engines, repair methods and simple elements of meteorology. . . . Your club set-up should make provisions for a senior advisor . . . one'll be helpful in ironing out difficulties that arise now and then in the best of clubs. . . . Before selecting officers: Remember a board of directors enables more persons to assist in running the club. . . . Besides appointing or electing a secretary, snare somebody's good-natured sister to serve as Recorder—she'll keep track of activities, progress of the individual members and contest results.

ANSWERS TO QUESTIONS:

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Back to special positions: Surely you know another young lady interested in aviation who would be a dandy librarian for the club . . . she'd keep tabs on the books and magazines belonging to the organization as well as compile a scrap book of local and national model aviation news. . . . And we can use an official modeling photographer (reimburse him for the materials he uses instead of asking him to dip down into his own pocket) . . . and a club artist to take care of posters announcing the big invitation meet . . . and to top off our impressive line-up of officials—publicity chap to edit the club's paper and send out stories of club activities to MODEL AIRPLANE NEWS and local papers. The club paper is an important item even if it's only a single typewritten sheet posted where all may read or passed around from member to member, or a hectographed, mimeographed or printed affair . . . regardless of the kind, don't be without a "publication."

It's quite possible meetings may be held for awhile in someone's home—until a more spacious hall is obtained . . . get help to the Golden Rule and repay your host's kindness by taking turns cutting grass, shoveling snow or washing windows. . . . When time approaches for your meets ask the merchants for modest prizes, also the neighborhood model shop . . . steer away from expensive, pretentious "hardware" for contest awards and you'll avoid headaches. . . . At club contests: Include events that are different such as hydro flights, spot landing competitions and an event in which entrants try for a specified flight duration such as 50 seconds. . . . With club affairs running along smoothly don't loll around. . . . Find out what models are available and put on displays at the expositions and hobby shows; run meets at the Fair. . . . And when a super-colossal aviation film is scheduled for the theatres, contact the managers and suggest a display of models for the lobby in return for two tickets of admission for each club member. . . . Maybe the manager will be willing to hire an expert to appear in the lobby with the display to tell a bit about the models as well

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Designing Your Gas Model

(Continued from page 27)

of which determine the characteristic values of the propeller after it is completed.

Now in order to carve the propellers required for planes No. 1 and No. 2, all that the builder has to do is to determine the exact measurements of the blocks for each case, and then proceed to carve out the propellers by the diagonal method. These blocks may be laid out graphically as described previously, or their dimensions may be calculated. In the latter case the diagonals are drawn from the corners, tangent to the shaft hole after the rectangular block of correct length, width and thickness has been selected.

The problem now is to determine the correct block dimensions for the two specific cases in hand.

Obviously the length of the block will

be equal to the diameter of the propeller, or about 1/8 inch more to allow for trimming possible rough ends. For propeller No. 1 the block would be 22 1/8 inches long, and 15.4 inches long for propeller No. 2. The proportion of block width to block depth is determined by the ratio between the propeller diameter and pitch. It is expressed as follows:

$$\frac{w}{d} = \frac{\pi D}{P}$$

The proportions of block No. 1 would be:

$$\frac{\pi D}{P} = \frac{\pi 22}{14} = \frac{69}{14} = \frac{w_1}{d_1}$$

$$\text{or } d_1 = \frac{w_1}{4.93}$$

In the case of block No. 2:

$$\frac{\pi D}{P} = \frac{\pi (15.3)}{7.4} = \frac{48}{7.4} = \frac{w_2}{d_2}$$

$$\text{or } d_2 = \frac{w_2}{6.49}$$

The actual width of the block can be determined as follows by the application of a simple rule and a little calculation. The distance between the diagonals on any face of the block at a point halfway between the center of the shaft hole and the end block should be equal to the desired blade width. Thus the distance between the diagonals at the block ends should be twice this distance, less a distance equal to the diameter of the shaft hole. Usually this is about one-quarter inch. This distance is subtracted because the spread between the diagonals at the block ends is reduced slightly from the normal value due to the diagonals being tangent to the shaft hole at the center of the block. They are therefore spread apart about one-quarter inch at this point. This makes their spread one-quarter inch less at the block ends than if the diagonals passed through the center of the shaft holes.

The width of any propeller block at the ends may be written in formula form as follows: $w = (2W^B - 0.25)$.

Then the width of block No. 1 is:

$$w_1 = (2 \times 2.2 - 0.25) = 4.15 \text{ inches.}$$

The width of block No. 2 is:

$$w_2 = (2 \times 1.53 - 0.25) = 2.81 \text{ inches.}$$

The depth of the blocks now may be found easily as the depth (d) is a definite proportion of (w) in each of these two cases. We know that the depth of

block No. 1 $\frac{w_1}{4.93}$. Therefore, $d_1 = \frac{4.15}{4.93}$, or depth of block No. 1 = $d_1 = 0.842$ inches.

The depth of block No. 2 = $d_2 = \frac{2.81}{6.49}$, or Depth of Block No. 2 = 0.433 inches.

The dimensions of block No. 1 are, then: Length, 22 1/8 inches; Width, 4.15 inches; Depth, 0.433 inches.

By applying the diagonal layout method to blocks of these dimensions the propellers may be carved out accurately by the average model builder if he follows the carving process outlined in article

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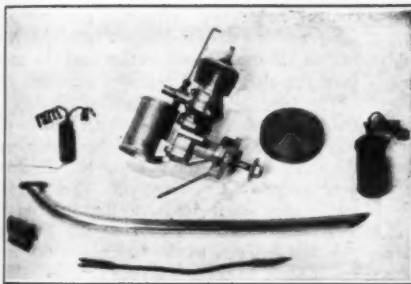


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No. 81, January, 1939, issue.

Having completed the design of the propeller for your gas model, all of the necessary design factors have been determined. It remains but to incorporate them in the working plans for the plane so that its construction may be carried out and finally take the form of your perfect "gas model dream ship."

Following are the complete outlines of the correct design factors embodied in the two high performance models, the designs of which have been developed progressively throughout the preceding articles.

Plane No. 1

Span = 90".
Wing Area = 1037 square inches.
Center Wing Chord = 15".
Dihedral Angle:—raise each wing tip (5.63) inches above the highest point of the center section.
Tail Moment Arm = 36".
Nose Length = 12".
Distance of the C.G. below the thrust line = 1.5".

Distance of the center of Lift above the C.G. = 8.25".

The Center of Lateral Area to be on a horizontal line passing through the Center of Gravity.

Fin Area = 83 square inches.
Stabilizer Area = 311 square inches.
Propeller Pitch = 14".
Propeller Diameter = 22".
Maximum Propeller Blade Width = 2.2".

Engine = 1/5 horsepower.
Engine Speed = 4000 R.P.M.
Propeller Speed = 2000 R.P.M.
Wing tips and tips of Fin and Stabilizer of both models should be elliptical and the whole plane streamlined to the fullest extent of the builder's art.

Plane No. 2

Span = 75".
Wing Area = 677 square inches.
Center Wing Chord = 11 7/8".
Tip Wing Chord = 7 1/8".
Dihedral Angle: Raise each wing tip (4.69) inches above the highest point of the center section.



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Tail Moment Arm = 30".
Nose Length = 10".
Distance of the C.G. below the Thrust Line = 1 1/4".
Distance of the Center of Lift above the C.G. = 6 7/8".

The C. of L. A. to be on a horizontal line passing through the Center of Gravity.

Fin Area = 54.16 square inches.
Stabilizer Area = 203 square inches.
Propeller Pitch = 7.4".
Propeller Diameter = 15.3".
Maximum propeller blade width = 1.53".

Engine = 1.5 horsepower.
Engine Speed = 4000 r.p.m.
Propeller Speed = 4000 r.p.m.

Next month hints will be given that will show you how to CONTROL your model by proper adjustment.

America's Most Modern Gas Model The LANCER

45" model, for motors up to 1 1/2 H.P., uses simplified monocoque construction. It has a greater strength/weight ratio and can be built quicker than ordinary types. The ribs, formers and sides are cut out in the Kit which also includes gas type air wheels, cement, dope, etc. **\$2.95 p. p.**

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Gas Lines

(Continued from page 15)

twelve inches. He continues:

"I took it to Manger Drome and was dubious about flying it in the fairly strong breeze that was blowing. However I tanked it up and set the timer. It was a nice take-off and good climb, and soon it was time for the timer to do its stuff; but it didn't and she headed out over a tidal estuary about 3/4 mile wide at this point. I had made a special small tank and it held enough to get the model across the drink and land it in a hedge 100 feet from the water's edge. Phew!"

The Auckland Aero Club has just celebrated its tenth birthday; having been active since its inception. This is quite a remarkable record.

Picture No. 5 will give you an idea of what the Russian gas model builders are flying. It shows Rais Murtazin, a gas

model builder from the city of Ufa, Bashkir U.S.S.R., with his ship, which is powered with a benzine motor. Evidently in Russia there are no fuel limits or motor-run limits; they put in as much gas as possible and "let 'er go." This model has stayed in the air as long as five hours.

In the December 1938 issue we showed a picture of what we believed was the smallest engine in existence, built by Mr. Owen Chapman. However Mr. Henry Ball of 4450 Cheeseman, Drayton Plains, Michigan, comes back at this with the claim that he has the smallest engine; which we show in picture No. 6. He tells us it has a 1/4 inch bore and 5/16 inch stroke which gives a piston displacement of .0154. The piston displacement of Mr. Chapman's engine is .0262 cubic inch. Thus actually Mr. Chapman's engine is 70% larger than Mr. Ball's. The engine shown here turns a fly-wheel approximately at 8000 revolutions per minute. It is 1 5/8 inches tall and 5/8 inch in diameter, inside of which is the ignition breaker.

Mr. Howard E. Roberts of 1525 Webster Street, Palo Alto, Calif., sends us picture No. 7, which shows a speed gas model designed and built by Lowell S. Johnson of 2361 Woolsey Street, Berkeley, Calif. It is one of the snappiest-looking speed planes that has ever been shown in "Gas Lines;" and it is strictly for racing. The wing span is three feet and, as you will note, it has a retractable landing gear, shown here in the folded position. The plane weighs about 3 1/2 pounds ready to fly. The whole job is monocoque; the only control being the trimming tabs on one wing and on the stabilizer. The fuselage has an elliptical cross-section and the cowl is of tin, shaped and soldered together.

The landing gear mechanism consists of two timers one for the ignition and to release the gear when it cuts the motor, and the other retracts the landing gear in about four seconds after taking off. The mechanism is very much similar to that used on the Folkert's Racer last year at the National Air Races, even to the hatches which fold up in place to cover the hole through which

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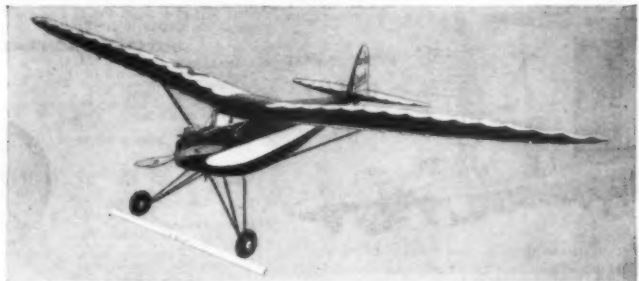
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- **PROVED DESIGN** Rugged, light, aerodynamically efficient. Surfaces quickly demountable for transportation or storage. Beautiful to see; practical to operate. Access to coil and condenser without removing cowl. Landing gear readily demountable.
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the landing gear passed.

This is the second racing gas model built by Mr. Johnson. His first was of the same construction, but was a low-wing model. It made many very fast and stable flights, until gliding into a telephone pole at 40 M.P.H. after just passing over a car on the highway going thirty-five. This plane had a very flat glide, although very fast. Having a four foot span, it was however much slower than the newer racer.

The speed of his latest racer is not available, as yet.

In picture No. 8 you see the "heavenly triplets" at a big gas contest staged at Arlington, Calif., last year; in which there were about 200 entries. The triplets are three camera gas models, designed by Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif. Weathers built one of them, while the other two were built by other flying enthusiasts in San Diego—James R. Lay and Charles Underhill. The ships were built from the plans of this model which appeared in MODEL AIRPLANE NEWS. Weathers' ship placed fifth in the contest, remaining aloft three minutes, eighteen seconds, in the 35 second engine-run event.

In picture No. 9 we have a scene which may be reminiscent of despair in many gas model builders' careers. We do not wish to bring up unpleasant subjects, but nevertheless "facts is facts," and in order to enjoy the pleasant things in life sometimes we must look upon those which are not so joyful. We do not know the owner of this ship, but we do know that the resulting

crash put an end to this model's activity. One who is so inclined, may see a moral in this picture. It might be as follows:

Be sure that your batteries are tight in their holder before making a flight; otherwise they may shift from position and cause diving or stalling or—then again, perhaps the wing shifted in this plane. There are many things which may have caused the fatal maneuver shown. Whatever it was, it is always a good policy to be sure that your plane is well constructed, well adjusted and carefully flown under all circumstances.

This picture was contributed to us by James Condon of 140 South 6 Street, Newark, New Jersey; who tells us that the tragedy took place during the Kresge Club Eastern States Contest, held at Hadley Field, New Jersey.

New Club Founded at Newburgh

Mr. William Greenhalgh Junior of 180 Gidney Avenue, Newburgh, New York, writes and tells us that model builders in Newburgh have gotten together and formed the Stewart Model Club. He says:

"This club was organized in the early part of November, 1938, with the aid of same adult members in order that we might better pursue our hobby.

"Formed with a membership of fourteen, the club has, in one week, grown to a membership of twenty-nine. This can be explained partly by a large display in the windows of the local office of the Central Hudson Gas and Electric Corp. and partly by the fine enthusiasm of the fellows.

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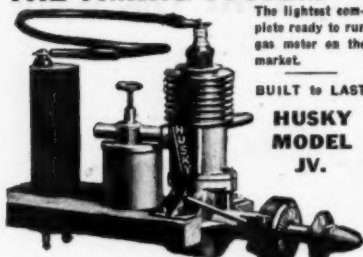
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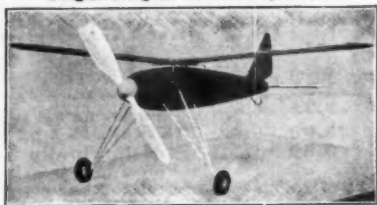
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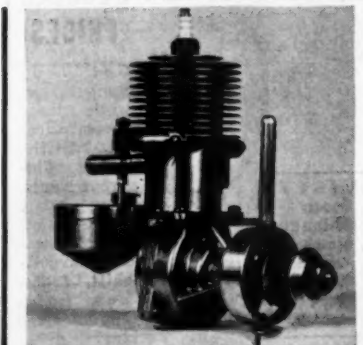
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"The club was formed originally as a gas model club but it was decided to accept any model builder over fourteen years of age as a member. It was our contention

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that just because a boy has not yet begun to build gas models he should not be kept from membership. We believe that we can do more for these fellows by helping them in their problems with rubber-powered models and eventually initiating them into the art of building and flying gas powered model airplanes.

"We have obtained permission from the army authorities to use the newly-constructed Stewart field for our flying. We feel extremely fortunate in securing the use of this field and the assistance of several of the West Point officers who are connected with this field."

Picture No. 10 shows a group of club members becoming acquainted with some of the intricacies of gas model design and construction.

Bill Condeman of Miami, Florida, sends us picture No. 11; which shows the plane that won a Miami model contest last summer. He says that the model is built up from two other ships; the wing from one and the fuselage and tail surfaces from the other. The plane shown has a six foot span and is powered with a Brown engine. It has won a number of prizes, including a Hurlerian motor, coil and spark plug. The best flight time so far is seven minutes, thirty-four seconds, with a limited engine run. Bill tells us that he hasn't missed an issue of MODEL AIRPLANE NEWS since he "started playing around with rubber models" some time ago.

Here is what we call a beautiful gas job;

shown in picture No. 12. Though it is not a parasol, it is exceedingly well designed for stability. The line of thrust is high, the center of gravity fairly low with the lateral projected area (that is the center of lateral area) of the plane approximately on a level with the center of gravity. It's streamlined, as you can see, to the nth degree. It has an 8 1/2 foot elliptic wing and weighs, complete, 4 1/2 pounds. This is exceptionally light, considering the fact that the fuselage is planked. All the switches, timers, etc., are enclosed within the body. The wing section is a Grant X-8, and it is powered with an inverted, syphon-feed, Brown "B" engine. Alex Johnson of 7949 Avalon Avenue, Chicago, Illinois, its builder, says it has a remarkable glide and is the stablest flier he has ever seen. He is now installing a Forster engine in order to give the ship greater performance, which is needed at contests with a thirty-second motor run. Johnson tells us that he has been building models for over eight years and is an ex-member of the Chicago Aeronauts.

Builders in Texas are doing some great flying. In picture No. 13 we see Robert C. Rutledge of Houston, Texas, with his ship which has placed in six consecutive major contests, all of which had over 70 entries. Picture No. 14 shows another ship of Bob's.

We are indebted to Bob's father for this information concerning him. Mr. Rutledge Sr. says:

"In this model (designed and built by my son Bob) every effort was made to conform to the principles laid down in Mr. Grant's articles appearing in MODEL AIRPLANE NEWS, and any deviation was due to the necessity of hurried construction.

"The model was finished June 10th, but due to high winds we were unable to even glide it until we arrived at the Ft. Worth contest June 12th. Two glides and a short half-power test-hop indicated that all adjustments were correct and an official flight was made. This flight won the meet and set an official N.A.A. record for 30 second motor-run for 10 oz. ships.

"Through an error of the officials the model was described as a modified 'Bucaneer.' It was actually a Grant type with double ellipse wing, Grant X-8 wing section.

"The record of the model for the balance of the season is: Dallas 2nd, San Antonio 2nd, Houston 3rd, New Orleans 3rd, Galveston 1st, also placed in several special events. There being no time to construct a larger elliptical wing when the weight rule was changed, a straight wing was used in the later contests.

"I believe that placing in 6 consecutive major contests (average over 70 entrants) sets a record that really means something. Any model may 'luck out' in one meet, but only a ship with a basically correct design can be consistent and the credit for that is yours. A new streamlined version

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of the R-G is now on the drawing board and we hope to show it to you at the 1939 Nationals.

"There is a feeling throughout the Southwest that holding the Nationals in Detroit each year is rather unfair.

"A petition from clubs representing several hundred members will soon be presented to the N.A.A. requesting that the 1939 Nationals be held in a location more accessible to the south and southwest. Even St. Louis which is 1200 miles from here would be very satisfactory. I am sure you realize what a boost that would give modeling in this section."

Metropolitan Model Airplane Council

The Metropolitan Model Airplane Council, composed of model clubs in the greater New York area, has announced their gas model program for the coming year. It will consist of a gas meet April 2nd, using the new National Aeronautic Association rules. There will be the regular Endurance Event, a Specialty Event for unusual ships and Radio-controlled models. Entry fee will be 25c, and the meet will be open only to builders who are members of a club belonging to the Metropolitan Model Airplane Council.

At an election recently held, the following officers were reelected. Irwin S. Polk, President; William Effinger, Secretary, and Sam Block, Treasurer.

The Council is conducting a census under the supervision of Lewis Garami, to determine the trend in model building in this area. In this manner information as to whether model builders are swinging towards gas models, endurance models, etc., can be determined in advance and activities planned accordingly. The results of this census may be obtained by writing to the Council Secretary.

A survey is being made to determine which fields are suitable for power model flying within the 5 or 10c fare limit of New York. When this survey has been completed, steps will be taken by the Council to arrange for the use of a field as a

model airport, and the assistance of city and aviation officials is now being sought in order to obtain such a field for the model builders in the New York area.

Model airplane clubs, rubber or gas, are invited to join the Metropolitan Model Airplane Council so that they may participate in the cooperative activities to be conducted by the Council. For information write to the officers, at 429-7th Avenue, New York City.

N.A.A. News*(Continued from page 13)*

Little Rock, Arkansas, was the winner of last year's insignia drawing competition and his design was incorporated in the official insignia of last year's meet.

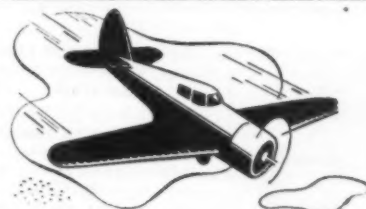
Model builders throughout the nation are developing new ideas and designs for models to be entered in this year's great classic. There is no doubt that 1939 will be a banner year for both endurance and gas engine power models.

The detailed rules will be announced in this magazine just as soon as they are released. Watch for them!

New Model Membership Setup

Last month we gave you the skeleton of the new membership plan for modelers of the N.A.A., which is presented in the interest of a greater national program for model building and youth aviation education. Now we shall attempt to nip in the bud any questions pertaining thereto by explaining the setup in detail.

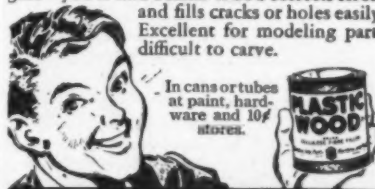
A simplified basis of affiliation for large model clubs and model organizations with N.A.A. is now provided to accelerate such affiliation. With joint operation of all model groups nationally through affiliation with N.A.A., many possibilities arise for development of greater industry and government support. This program makes possible affiliation of your entire organization with N.A.A. at a very reasonable fee.



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Quickly, permanently joins
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celluloid, etc. Transparent—
or Metal color. Get it at paint,
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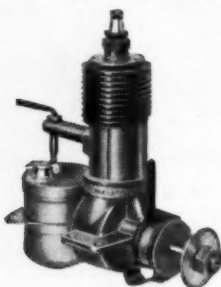
**Old English
CEMENT**



NOW ... only \$10⁰⁰

BROWN JR. MOTOR Model D

(complete with coil and condenser)



Bore, 7/8".

Weight (bare), 6 1/2 oz.

1 1/2 h.p. R.P.M. 1200 to 10,000.

Height, 4 3/4" (including spark plug).

"Z" metal counter-balanced crankshaft.

Connecting rod of forged aluminum alloy.



MAKE YOUR MOTOR RUN BETTER WITH THIS NEW SPARK PLUG

Engineered especially for model motors. High-tension dielectric heat resisting core. Special thermo-controlled center electrode. Concentrated, powerful spark for easy starting. Leak-proof for perfect performance and long life. Make your model motor run better. Change to the J-M Spark Plug today. 65c each.

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TRENTON PETROLEERS
MEET Mercer Airport. Harold
Johnson won R. J. Hughes
trophy... setting new official
N. A. A. Record

EASTERN STATES MEET
1st-2nd-3rd-4th- and-5th
places to Brown Model D

11th ANNUAL NATIONAL
CHAMPIONSHIP MODEL
AIRPLANE MEET, Detroit
All major events won by
Brown Motors

GULF STATES MODEL AIR
MEET, First Place

SOUTHERN CALIFORNIA
GAS MODEL MEET... 1st-
5th-6th-and-8th places

NEW YORK GAS MEET...
1st and 2nd places

6th ANNUAL MISSISSIPPI
VALLEY MEET... Winner of
Performance event

Sold by leading dealers.



It enables all members of large model clubs to participate in the advantages of N.A.A. affiliation *without the requirement of individual membership in N.A.A. in addition to membership in their local club.*

Under the new program the individual 50c membership in N.A.A. will be discontinued at the expiration of existing memberships of this class. Expert rubber model builders who desire individual membership will be eligible for Associate (\$1.00) membership in N.A.A., which during the membership term will carry the privilege of registration as a gas model member without additional charge. Individual gas model memberships and licenses will be continued, on the present basis. Gas chapters will be continued, as this type of affiliation is preferred, except that the number of individual members required to gain a chapter charter is increased to 20. Exceptions will be made only if the amount of local activity makes this impossible.

From a national viewpoint it is felt that every gas model flyer should hold the official gas model license. With all members of a gas model club holding such license, and therefore N.A.A. membership, the gas model chapter membership requirement becomes no special burden.

Under the plan as covered by the affiliation agreement, each member of an affiliated organization would be considered to hold in effect a letter of authority from the N.A.A., stating that he could try for national records without the requirement of individual membership in the N.A.A., with the understanding that if a record was made, he could make application for the N.A.A. Sporting License for model aircraft.

Affiliation fees for groups of various sizes are as follows: any number under 100, starting with a minimum of 10 members, \$5 per year; 100 to 1,000 members, \$10 per year; 1,000 to 10,000 members, \$25 per year; over 10,000 members, \$50 per year.

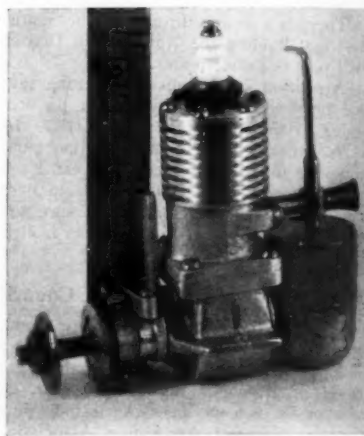
Chapter News

Contest Director Louis Garami of the Queens Aero Model Assn. sends in four records which were posted at their ROW meet held at Holmes Airport, December 11, out on Jackson Heights, Long Island. The fliers were Paul Plecan, Ray Prussing, Henry Struck and Chris Berger. Times of the flights will be noted in the January issue of the "Eagle". Nice going, boys... The Cleveland Women's Chapter, N.A.A., pulled a new one out of the bag, which, although not officially sanctioned, is quite worthy of note and imitation: their operations took on another phase when they sponsored a "NAME A PLANE" contest directed by Ed Clark, Scripps-Howard Junior Aviator editor. Hangared in the contest rooms were a group of about fifty model planes, ranging from the old pushers to the very latest word in modern aircraft, the idea being that the contestants should name as many ships as they could and write an essay on "Why I Like Model Plane Building As A Hobby"... interesting note on the competition was the way discussions were carried on about increased horsepower, superchargers, valves, engine reliability, etc.; made you think of the gang around the hangar stove back at the home port... other activities carried on by

the Cleveland Women's Chapter consist of placing aeronautical speakers in the schools, distribution of aviation magazines and literature, and directing personally conducted tours around the airport, through the buildings, right down to parachute folding demonstrations.

Anyone losing a model carrying N.A.A. numerals and the N.A.A. identification sheet is invited to use these columns to try to locate it. We have received a card from George Tabery, NAA-867, who lost his ship while competing in a meet held at Mercer Airport near Trenton, N.J. You may be sure that any information leading to its recovery will be appreciated...

We have received a report from the Southern Connecticut Gas Model Club, formerly the Noroton Heights Gas Model Club, covering their activities for 1938 and their attitude toward the future. Late in 1937, five aerodynamically-minded model enthusiasts got together and formed a club which was named the Noroton Heights Gas Model Club—associating themselves with the I.G.M.A.A. Once they had picked up momentum, the going became easier, and their number increased steadily, until they now have thirty-five members, who were present 100 per cent at the Eastern States



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Complete as
shown with con-
denser and coil
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for more than
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Weight, 3 1/2 oz., bare; 1 1/2 H.P.;
Bore, 5/8"; Stroke, 17/32";
R.P.M., 500 to 8000

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\$6.00

Complete without motor

61" wingspan, length 39"

weight 2 1/4 lbs. without motor

Equip with any standard miniature engine. Kit includes—Wood cut to size, Pneumatic Air Wheels, Formed Shock Absorbing Landing Gear, Die cut Ribs, all needed Parts. Complete without motor **\$6.00.**

IDEAL'S famous TRU-CUT KNIFE—the only all-purpose tool for model building. It is held and operated the same as a pen. It is especially designed for cutting balsa wood, stencils, paper patterns, and other objects requiring accuracy of detail. Price 15c. postpaid.



NEW

H. M. S. Revenge
18" Model, \$1.00

NEW

Schooner
Marion Sprague
22" Model, \$1.00

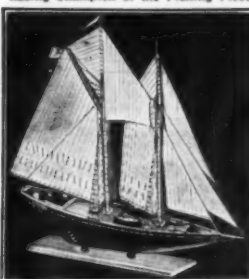
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Racing Champion of the Fishing Fleet



Build this latest winner and new Champion. Kit includes carved PINE hull, cast metal life-boats, anchor, chain, lacquer, casks, dowels, cement, sail cloth, rigging thread, and full size plan with thorough instructions.

\$2.50 Complete

SHIP MODELS with MOULDED HULLS

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IDEAL AEROPLANE & SUPPLY CO., Inc.

Meet at Farmingdale, L.I., last spring, and at the Connecticut State Championship Meet sponsored by the Waterbury Gas Model Club, at which they captured the championship as well as 4th, 5th, 6th, 7th and 8th places. . . Weekly practice meets are held among the club members, the first one in each month being regarded as the competition meet for a trophy donated by F. Mesinger, a member, to be given as a permanent possession to the first contestant to win it three times. At the rest of the weekly meets in the month varied events are run including spot landing, limited engine run, endurance flights and general flying performance; the purpose being to give all types of gas jobs a fair chance of winning. Prizes consist of model accessories, donated largely by local model-supply houses. . . 1939 plans include a continuation of the weekly contests, including ski-flying and participation in a greater number of outside meets, in addition to lectures and possibly moving pictures at the regular bi-monthly meetings. . . the slogan of the Southern Connecticut Gas Model Club is a quotation of unknown origin—"Our hats off to the past—our coats off to the future."

Air Ways

(Continued from page 29)

Davidson of 1054 Faile Avenue, New York City, was in charge of the exhibit. He is shown in picture No. 5 describing the features of one of the first Bleriot monoplanes, which he is holding, to Miss Louise Campbell, who starred in the production. Miss Campbell holds a model of the early Wright plane.

Last September model builders of the Springfield and Westfield Model Club held their second annual Hydroplane Contest at Congamond Lakes, Mass. Picture No. 6 shows a group of the fliers starting their models for a mass flight from the shore. They are, left to right: Al Bogush, Barbara Maschin (one of our noted feminine model fliers), Ernest Walen (club director), Joe Delaney and Danny Clini. This group is extremely active though they do not make very much fuss about their research work and flying. In fact, very little is heard from them except at national contests, where they always give a fine account of themselves.

Some builders feel that interest in and the building of World War planes is rather out-of-date. On the other hand, there are

a number of model experts who are extremely interested in this type of plane. We believe that the latter are justified in their position, which viewpoint is upheld by a recent incident that occurred in England. A dog-fight was staged with camera guns between one of the modern high-speed pursuit ships and an old war-time Sopwith Camel. The high-speed ship went zooming all over the sky, leaping by the war-time craft as if the latter was standing still. However, when the fight was over and the photographic plates developed, it was shown that the high-speed craft was "shot full of holes," while the old, war-time "crate" was ready for another battle. In order to eliminate the possibility of the pilot of one craft being more expert than the pilot of the other, the process was repeated—with the same results! What is the answer to this? A little concentration will disclose the explanation. The modern, high-speed ship could fly BY its adversary but was unable to maneuver quickly and with dexterity. It required several miles in which to make a turn. Due to its speed, the arc of every maneuver was very large; while the little war-time fighter simply flipped over on its beam-ends and was, in a very few seconds, in position to riddle its enemy.

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A CONSISTENT PERFORMER

A motor radically different, of clean design and rugged construction, hardened crankshaft—hardened piston—hardened piston pin—steel drop forged hardened connecting rod—one piece cylinder—foolproof ignition system.

Specifications

Bore, 900"; stroke, 31/32"; R.P.M., 10,000;
H.P., 1/5 plus; Weight, bare, 7 3/4 oz.;
Height, incl. plug, 4 11/16"; Displacement,
.616-10 c.c. Factory tested and guaranteed.

All motors complete with coil, condenser, etc., ready to run.

Prices
Special, \$11.80
Standard, 17.80
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2 in 1
DeLuxe Midget Gas Model Kit
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THE HUMMING BIRD

Simple to build; an outstanding performer for competition or sport. NOTE: The Humming Bird is the ONLY MODEL DESIGNED TO FLY AS A BIPLANE OR MONOPLANE! ★ Removable power unit ★ Ready cut notched ribs ★ M & M Pneumatic Wheels ★ Semi-carved Propeller ★ Full size plans ★ Colored bamboo paper ★ Design by Frank Ehling ★ Berryfold Liquids.
100% complete Kit.....\$3.95
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The "HI-SPEED"

A powerful, intermediate motor which is becoming more popular every day. 1 1/2 H.P. 273 cc. in. upright or inverted.....**postpaid \$12.75**

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Aluminum MOTOR MOUNT

For all Midget Engines under 1 1/2 H.P. Weighs 1 1/2 oz. Handy and practical. **35c pr.** Only.....**35c pr.**



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A Necessity
Only - - **\$1.00**



Dural Timer for large & small ships.
Reduced to.....**\$1.95**



Exhaust Manifold

\$1.00 only



Tail Wheel and Fork

Made of aluminum with sponge-rubber wheel. Weights 1 1/2 oz. Fits all gas models. **50c**

POLK'S PERFECT PITCH SHAPED PROPELLER

JUST SAND IT!

Only 25¢ 10" POST PAID 35¢ 14"

POLK'S MODEL CRAFT HOBBIES, Inc., 429 Seventh Ave., Dept. M-3, New York, N.Y.

NOW IN OUR NEW STORE—BETWEEN 33D AND 34TH STS.

SpeedWay

Now REAL Quality Tools

Products of Speedway, leading manufacturers of electric tools for industry, these new drills are correctly designed, operate at most efficient speeds, and embody the feature, power and capacity of much heavier and more costly tools.

1000 RPM DRILL powered by genuine high torque Speedway Drill motor has die cast handle and gear case. \$7.95.

20,000 RPM HAND GRINDER, new for more efficient design. \$9.95.

Speedway No. 250 Kit—Drill, Grinder and 5 accessories in steel carrying case \$14.95. Also complete line of cutters stones, etc., and stand to convert into lever fed Drill Press or Precision grinder. Ask your dealer or write direct for circular. Dealers write!

SPEEDWAY MFG. CO.
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New AIR DEFENSE PROGRAM

Calls for thousands of men!

★ LEARN AERO DESIGN DRAFTING QUICKLY!

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The truth of this statement has also been conclusively demonstrated in the war in Spain, where slow, maneuverable fighters have consistently outclassed the high-speed ships. Of course, the slow planes cannot run away, but when it comes to a fight they are "there."

One of the famous war-time craft was the Bristol F2B. This was developed toward the end of the war and was quite a remarkable ship. A beautiful scale model of this plane is shown in picture No. 7. It was built by Norman McKinley of Verona, Pa., R.F.D., Hulton Road. It has a wing span of fifteen inches and, what is most remarkable, it was constructed from a tent kit. This goes to show that the appearance of any model is dependent to a large extent upon the workmanship of the builder.

Another beautiful piece of scale model handicraft is shown in picture No. 8. It is a solid balsa model of a Martin Clipper, built by Edwin Poole of 45 Oak Avenue, Riverside, Rhode Island. The ship has a wing span of 16-1/4 inches, and though quite small, it is most realistic and gives evidence of fine workmanship.

Picture No. 9 shows Clifford McBaine of 301 North 9 Street, Columbia, Missouri, with his Grant Wakefield job, with which he has made flights of over two minutes. He says: "Due to some faulty adjustments

I was not able to make a good flight with it in a contest I recently entered. Nevertheless, I won fifth place with it."

McBaine wishes to suggest to anyone building this ship that he used shorter strands than were specified in the article. The fuselage event of the contest McBaine mentions above was won with the same type model, making a flight of one minute, fifty-four seconds.

Our "trick" model builders have been at it again. Victor Leskowsky of 51 Parsons Avenue, Hoosick Falls, New York, sends us picture No. 10 which shows his solid scale Gee Bee Racer posed beside a package of cigarettes, in order that its size may be indicated by comparison. Despite its diminutive scale, the little plane has movable controls and a complete built-up nine-cylinder motor which contains all external individual parts. The windshield may be removed so that the controls may be operated. The little plane required 75 hours to build. The wing span is 11-1/2 inches.

A beautiful example of design and construction is shown in picture No. 11. It is a sailplane of original design, made by LeRoy Erickson of 6503 Leighton Avenue, Lincoln, Nebraska. It has a span of 48 inches and fully cantilever wing. The airfoil used is an Eiffel 387. The fuselage is a thin, tear-drop with an elliptical section throughout. Erickson does not tell us the results of flights he has made with this ship, but we hope he will soon let us know something regarding his tests.

Model News from Other Countries Sweden

Picture No. 12 comes from Oskar Eklof, Box 13, Torshälla, Sweden. It shows a part of his hangar with a number of the thirty-nine models he has built. Your editor had great difficulty in determining which was the top and bottom of this picture, so after examining it as well as possible it has been inserted in the position shown. Perhaps you can tell which is "up." Turn it around and view it from different angles; you will find it certainly is a puzzle. Mr. Eklof says that he and his friends are extremely interested in model building, but during the winter it is very difficult to get long flights where he lives because of the snow, cold and heavy winds.

England

Mr. G. Cudmore of 15 Elmsleigh Road, Twickenham, Middlesex, England, Press Secretary of the Ealing & District Model Flying Club, sends us picture No. 13. The little ship shown is a flying scale model of a SE-5, built by Mr. H. Combes. It was voted the best model exhibited at the show held recently by the club. This club was formed by Mr. L. B. Mawby in the latter part of 1936. The president is Professor A. M. Low, D. SC., well-known scientist. At present there are 46 active members, plus many others who are interested in flying. Each month this club sends a report to the "Aero Modeller" or the "Model Aeroplane Constructor," two English monthly model publications. This is a practice followed by many clubs, so that each one of them knows what the members of the others are doing.

Australia

We have a letter from Bruce R. Scarr, Hon. Secretary of the National Aeronautic Association of Australia, of 156 Adelaide Street, Brisbane, Australia. Mr. Scarr is very much interested in becoming affiliated with the N.A.A. of America. We regret to say that this is impossible, due to the set-up of the organization, for only citizens of the United States and Canada can become members of the Association in this country. However, actually, members of the N.A.A. of Australia are affiliated with this American organization through the FAI, the international organization. This latter organization is a world-wide unit which embraces all recognized organizations in various countries. In effect this makes all model builders a world-wide fraternity.

We will be most happy to receive news from the N.A.A. of Australia which we can publish monthly. Mr. Scarr says of his club:

"Our membership has increased extremely rapidly until now, after fifteen months of operation we can boast of a membership of nearly 300. Most of these are very active and enthusiastic fliers. Branches of the Association extend for over 1,000 miles, reaching as far north as Cairns and well down into New South Wales.

CLUB NEWS

Massachusetts

The Wachusett Model Aero Club, with headquarters at the Fitchburg Y.M.C.A., Fitchburg, Mass., is continuing actively. They are following a course of activity which might well be taken up by other clubs. That is, they are giving considerable attention to model builders who are just starting their model career. After all, it is interesting to know what the experts are doing, but nevertheless there are new builders coming into the game each year and it is essential that they are instructed in the principles of model design and building so that they will progress rapidly and along the right paths. Otherwise such builders often become discouraged and drop model building entirely.

New York

Mr. Carroll Moon of 1710 Newkirk Avenue, Brooklyn, New York, has been kind enough to send us the following information:

With a membership list which contains 25 active model builders, many of them are nationally known for the excellence of their performances in contest fields, the "Skyscrapers" Club have recently been organized in the Brooklyn, N.Y., area.

The Skyscrapers are temporarily operating under the guidance of a Supervisory Committee consisting of Messrs. Gustave Jung, Leon Schulman and Sal Taibi.

Among the members are Herbert Friedlander, who recently established a new N.A.A. record for hand-launched gliders; Maurice Schoenbrun, former Junior Birdman record holder; Gordon Murray, Kresge gas model contest winner in 1938; and many others. Members who have won major prizes for their contest endeavors during the past season are Messrs. Friedland-

KNOW WHY BUNCH MOTORS SURPASS IN PERFORMANCE

Judged on engineering features alone you will discover what experts have proven—the winning combination that is a Bunch motor.

You can now satisfy yourself with something better—an engine designed and specified by Bunch Engineers, for service in an airplane, speedboat or race car.

For fewer dollars than ever before you can power your models with the World's smallest, sturdiest, most reliable 1/5 h.p. engines. Select a Bunch engine and gain the performance of motors built to tested specifications.

PROVEN CONSTRUCTION FEATURES

CYLINDER—An outstanding Bunch development is the one piece all steel cylinder. The cylinder wall, cooling fins; streamlined funnel head; by-pass and intake parts* are all fabricated into one leakproof cylinder unit. There are no gaskets or bolts to tighten and distort the accurately machined cylinder wall. Power ported for greatest efficiency Bunch cylinder construction permits an unequalled power output per cubic inch displacement.

*The Gwin Aero and Speedway engine exhaust stack is also integral with cylinder.

PISTON AND PISTON RINGS—A "diamond ground" aluminum alloy piston is fitted with two centrifugally cast piston rings. Scientifically proportioned* these rings are as deep as they are across the face. They "seat" or seal compression while block testing and build power and improve as an engine is kept in service.

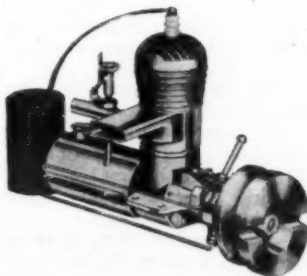
*Unusual power is developed because the compression seal with Bunch engines is dynamic; most effective at high speed when operating pressures fully seat the piston rings. Since the piston is not lapped to the cylinder wall there is no piston drag or piston wear.

CRANKCASE ASSEMBLY AND CRANKSHAFT—A bronze main bearing is cast directly into the one piece machine cast aluminum alloy crankcase and is pressure lubricated through a hollow drilled nickel steel crankshaft.

The compact timer assembly is efficient at all speeds. Point gap is quickly adjusted and points easily cleaned without removal of engine parts. Use of a handy control arm sets timer in any degree of advance or retard. The timer assembly is held securely with a self-locking marcel spring.

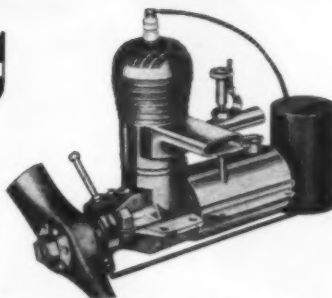
MECHANICAL SPECIFICATIONS

Bore $\frac{7}{8}$ ", Stroke $\frac{3}{4}$ ". Displacement 43 hundredths cubic inch. Horsepower 1/5 at 5200 R.P.M., $\frac{1}{4}$ at 8500. Height overall $4\frac{1}{4}$ ". Crankcase diameter $1\frac{1}{4}$ " O.D. Bare engine weight $6\frac{1}{2}$ oz. Engine rotation counter-clockwise, except Speedway. Engines and kits complete with coil, condenser, spark plug and all metal fuel tank. Engine kits have all bearings, piston and rings fitted and timer assembly set up.



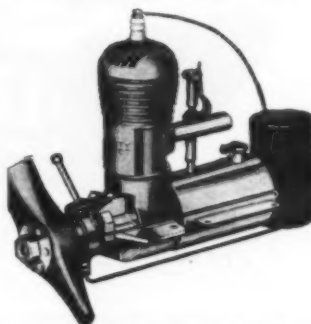
SPEEDWAY Race Car Engine

Assembled \$14.00
Kit 11.85



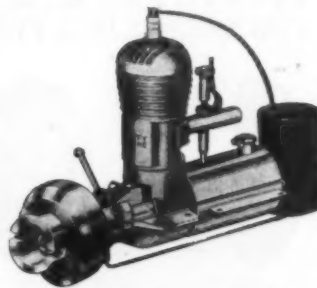
GWIN AERO Aircraft Engine

Assembled—Upright \$12.00
Assembled—Inverted 12.50
Kit—Upright or Inverted..... 9.85



MIGHTY MIDGET Aircraft Engine

Assembled—Upright \$ 9.50
Assembled—Inverted 9.75
Kit—Upright or Inverted..... 7.85



MIGHTY MARINE Speedboat Engine

Assembled \$12.50
Kit 10.85

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er, Schulman, Jung, Murray, Schoenbrun, Beitchman and Bacchi. Messrs. Schulman, Schoenbrun and Murray attended the 1938 Nationals in Detroit. The membership list consists of both gas and rubber model builders.

Michigan

We have received the following news release from the Department of Recreation, Detroit, Michigan:

A complete model aircraft program has been provided for Detroit and all Michigan model builders for 1939. A committee composed of vocational teachers, aeronautical engineers and model plane instructors from the Department of Recreation have combined their interests to establish and develop the field of youth activities in all forms of aviation. The following contests have been designated for the winter and spring program:

March 12—City indoor contest. Events will be: R.O.G., Indoor commercial, Indoor stick.

March 26—Military Miniature Contest consisting of flying a replica of modern military aircraft. Sponsored by Voiture 102, Forty and Eight Society, American Legion.

April 22—State Indoor Meet, consisting of Indoor Stick, Standard R.O.G., Indoor Commercial, Acrobatic Events.

May 27—State Outdoor Meet, consisting of Gas-Pay Load, Wakefield, Moffet, Non-flying Scale Events. This contest will be sponsored by the State Board of Aeronautics.

The plane used for flying scale will be the "Detroit News" Early Bird, a Lockheed

Orion. The "Detroit News" is the sponsor of this event.

The usual gas model duration event has been replaced by a pay-load contest which will emphasize the efficiency of the aircraft rather than a lucky flight.

The rule will be as follows:

$T \times W^2$

$\frac{D \times A}{T} = \text{Winner}$

T—Average duration in seconds; W—Pay load weight only. The net weight of the ship is not computed; D—Displacement; A—Wing area.

Montreal

Mr. Seth C. H. Taylor of 4757 Grosvenor Avenue, Montreal, Quebec, Canada, sends us the following report of club activities:

"A club was organized here in Montreal last winter and has had some very good results. We now number about 200 and have four branches throughout the city. We have held several indoor contests, but not until recently did we hold one outdoors.

"The contest itself was a success, even though the 'Gascades,' from Ottawa took all of our prizes from us. There was a high wind during the latter part of the gas event, during which I was unfortunate enough to have my 'Quaker Flash' crack up.

Connecticut

Mr. Alfred W. Schmidt of 29 Vernon Street, Hartford, Conn., sends us a report of the recent activities of the Model Aero Engineers of Hartford, local junior chapter of the N.A.A. He says:

"The Engineers started their fall activities on Wednesday, October 19th. A new and more extensive program was started in which the members will be taught the finer fundamentals of model airplane construction and flying. A class on enlarging plans was started by demand of junior members.

"Weekly meetings at the state armory are being held at which members are flying their models. In this new program actual model construction is done by all members at the meetings. The visiting of local aircraft shops is also being planned, besides having some well-known local aviation person speak to the group each month. Four new members were admitted into the club. They are as follows: Witold Kardys, Alvin Guilmar, Edward Bisailon, and James Howell.

"New officers of the club are: president, William A. Purtell, Jr.; vice president, Elbridge Joel; secretary, Dwight Watson and treasurer, John Pitrus.

"Meetings of the club are held at the Mitchell House located on 38 Lawrence Street, Hartford, on every Wednesday evening with the exception of holidays. Model builders and other visitors are welcome to attend any of these meetings."

Texas

Earl L. Rivers of San Jacinto Station, Amarillo, Texas, writes:

"Amarillo, Texas, a city of some 60,000 people, now has a model airplane club. A group of men and boys, ranging in age from 13 to 45 years, met on November 2nd and officially organized what is to be known as the A.G.M. Club (Amarillo Gas Model Club). A president, secretary and treasurer were elected.

"We have about twenty completed gas models here and more are in various stages of construction. We also have been granted written permission to use a dry-lake bed, which contains 640 acres (one square mile), for a flying field. This is only one mile from town.

"Amarillo is located in the panhandle of Texas on the great plains. The terrain is very flat and there are very few trees, although there are a few fences which act as hazards for the fliers. However we have wind—and more wind—seldom less than ten miles per hour. Thus we have very few good flying days, and this makes the holding of contests on set dates very difficult. Also, the climate is dry and taken in conjunction with our high altitude, we do have a rough time of it.

"Despite all this, however, we do turn in some good flights; and will soon send some pictures to prove it."

Best of luck, Texas. We hope you send those pictures soon as we know our readers will be interested to see evidence of how difficulties can be overcome if you put your mind to it.

Comments

Mr. C. S. Collins of 410 Pleasantview Avenue, Scotia, New York, writes as follows:

"Perhaps you will be interested to hear of some results I have had with one of the experimental airfoils published in your October issue.

"With an endurance model I had been trying to get at least a minute, but was rather unsuccessful. I changed the wing from a Clark Y to the Grant M2-7 and the results were remarkable. The model became more stable, had much better climb and certainly more glide. Before changing air-foils the best time obtained was 49 seconds. After changing to the Grant M2-7 the second flight was 1 minute, 51 seconds; the same number of turns being used in the motor each time."

We have some interesting comments from Jack Golden of 37 Clafin Road, Brookline, Mass. Securing sufficient funds to send the Wakefield team to the yearly contest has been a considerable problem for many years. Here is Mr. Golden's plan which may be undertaken to alleviate this difficulty.

"Probably the most enthusiastically discussed topic in conjunction with model airplane competition is the annual Wakefield event. In years past, financial difficulties have made it impossible to send a full complement from the United States. Is it not self-evident that the present method of raising funds is inadequate?

"We in Boston feel that each and every dealer has a very definite obligation to the game; for, after all, he makes most of the monetary returns of the hobby. Therefore, we feel that the burden of carrying the Wakefield costs should be carried by him and, in a measure, indirectly by the model builder. We have considered many methods of raising this money and the following seems to us to be by far the best.

"Each dealer is to be invited to join the Wakefield Dealer's fund. Membership in this fund will cost each dealer the same amount: namely, \$1.00 per year and, in addition, a small charge to cover publicity and advertising. For his initial dollar the

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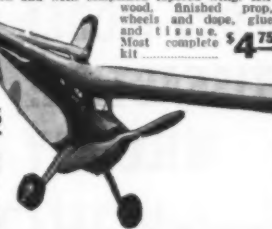
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1/2x1/2	2 for .25
1/2x1	2 for .35
3/8x3/8	3 for .25
3/8x1/2	3 for .35
1/2x1	1 for .18
1/2x1	3 for .25
1/2x1	3 for .25
SHEET BALSA	
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1/16x1/2	.04
3/32x1/2	.05
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for 3" stock, double 2" price	
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24"x36" 1 sheet	.05
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A strong, light silk imported specially for gas models.	
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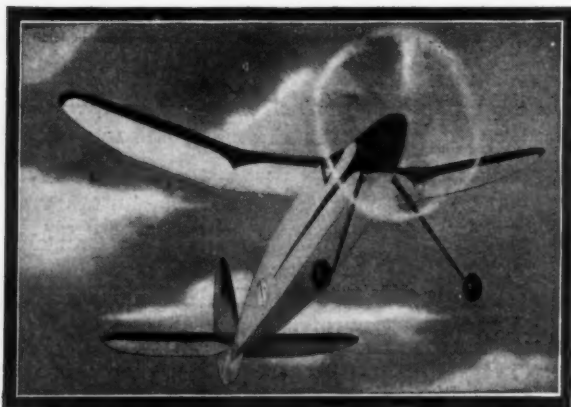
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- 1-large bottle paper cement
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- 1-sheet 1/8" printed balsa wood
- 1-sheet balsa 1/8 x 3 x 9
- 3-strips balsa 1/8 x 3/8 x 15
- 12-strips balsa 1/16 x 1/16 x 15
- 22-strips balsa 1/8 x 1/8 x 22
- 6-strips balsa 1/16 x 1/16 x 22
- 2-balsa blocks
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- 2-11" lengths bamboo
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- 1-strip sheet steel
- 1-pr. 1 1/2" balloon shape wheels

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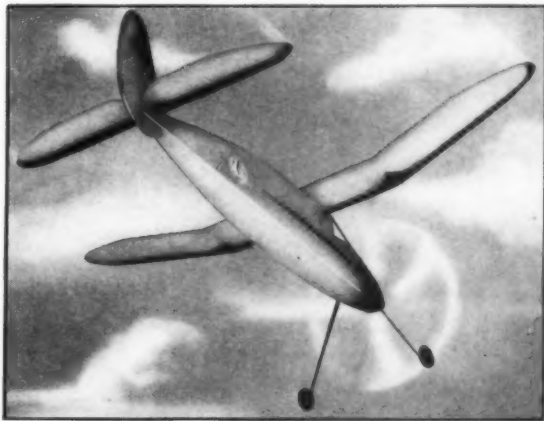
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